

# QST

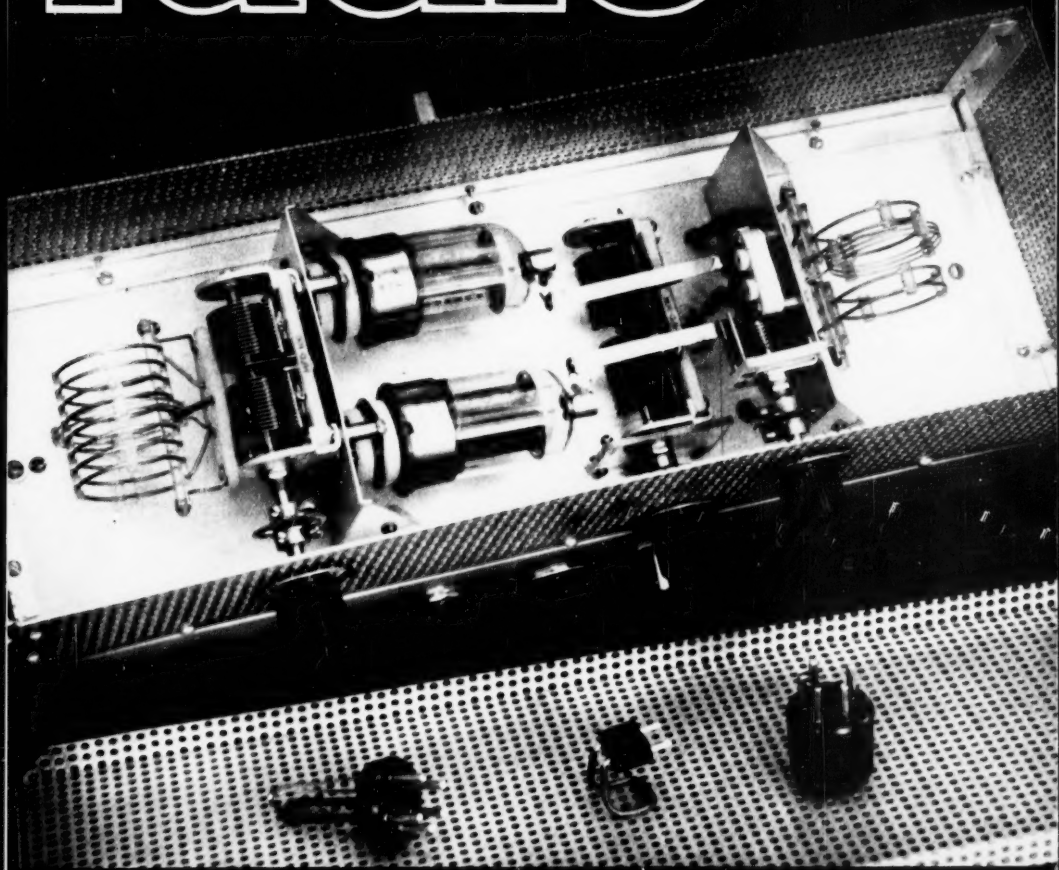
October, 1954

40 Cents

45c in Canada

devoted entirely to

# amateur radio



PUBLISHED BY THE AMERICAN RADIO RELAY LEAGUE

OUR MILLIONTH FILTER SHIPPED THIS YEAR...

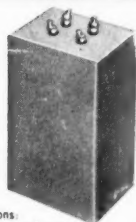
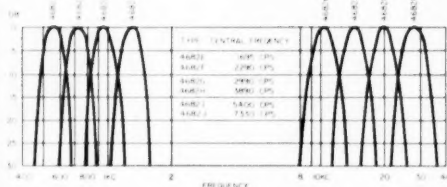
# FILTERS

## FOR EVERY APPLICATION

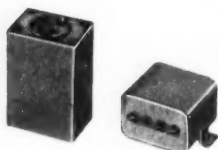


### TELEMETRY FILTERS

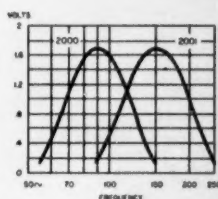
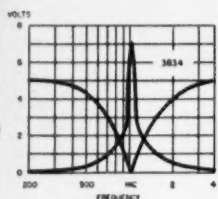
UTC manufactures a wide variety of band pass filters for multi-channel telemetry. Illustrated are a group of filters supplied for 400 cycle to 40 KC service. Miniaturized units have been made for many applications. For example a group of 4 cubic inch units which provide 50 channels between 4 KC and 100 KC.



Dimensions:  
(4882A) 1 1/2 x 2 x 4"



Dimensions:  
(3834) 1 1/4 x 1 1/4 x 2 3/16"  
(2000, 1) 1 1/4 x 1 1/4 x 1 1/4"



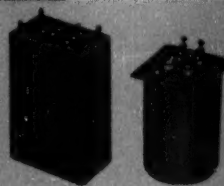
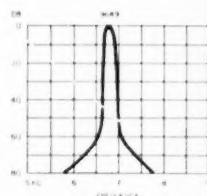
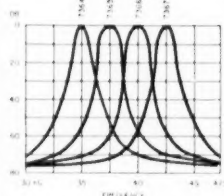
### AIRCRAFT FILTERS

UTC has produced the bulk of filters used in aircraft equipment for over a decade. The curve at the left is that of a miniaturized (1020 cycles) range filter providing high attenuation between voice and range frequencies.

Curves at the right are that of our miniaturized 90 and 150 cycle filters for glide path systems.

### CARRIER FILTERS

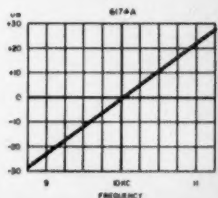
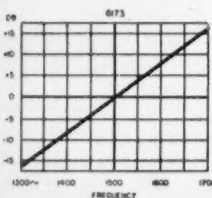
A wide variety of carrier filters are available for specific applications. This type of tone channel filter can be supplied in a varied range of band widths and attenuations. The curves shown are typical units.



Dimensions:  
(1000 series) 1 1/4 x 1 1/4 x 2 1/4"  
(900) 1 1/4 x 2 x 4"

### DISCRIMINATORS

These high Q discriminators provide exceptional amplification and linearity. Typical characteristics available are illustrated by the low and higher frequency curves shown.



Dimensions:  
(6173) 1-1/16 x 1 1/4 x 3"  
(6174A) 1 x 1 1/4 x 2 1/4"

For full data on stock UTC transformers, reactors, filters, and high Q coils, write for Catalog A.

**UNITED TRANSFORMER CO.**

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# Announcing THE THIRD ANNUAL

## EDISON RADIO AMATEUR AWARD

**You are invited by the Award Committee  
to nominate your candidate for 1954**

FOR the third successive year, you have the opportunity to single out for national acclaim someone who has rendered outstanding service while pursuing his hobby, amateur radio.

Only candidates who are nominated by letters from you and others, will be considered by the judges.

Naming the Edison Award winner is a tribute to the efforts of all amateurs in the public interest. By entering a candidate, you help make this tribute possible . . . and can win for yourself an expense-paid trip to the city where the Award will be presented.

Edison Award achievement is exemplified in the work of J. Stan Surber, W9NZZ, last year's winner. Mr. Surber since 1950 has served as a regular message link with hundreds of men on duty at remote Arctic weather stations—has handled, in all, some 20,000 personal communications.

Other new pages of amateur achievement are being written while you read this. Aid in honoring those responsible! Read the rules below . . . select your Edison Award candidate . . . and mail your nominating letter to *Edison Award Committee, Tube Department, General Electric Company, Schenectady 5, N. Y.*

### RULES OF THE AWARD

**WHO IS ELIGIBLE.** Any man or woman holding a radio amateur's license issued by the F.C.C., Washington, D. C., who in 1954 performed a meritorious public service in behalf of an individual or group. The service must have been performed while the candidate was pursuing his hobby as an amateur within the continental limits of the United States.

**WINNER OF THE AWARD** will receive the Edison trophy in a public ceremony in a centrally located metropolitan city. Expenses of his trip to that city will be paid. As a further token of appreciation, G.E. will present him with a precision timepiece to clock DX. In addition, the person responsible for the nomination of the Award-winning candidate will be invited to attend the presentation ceremony, and his expenses also will be paid.

**WHO CAN NOMINATE.** Any individual, club, or association familiar with the service performed.

**HOW TO NOMINATE.** Include in a letter the candidate's name, address, call letters, and a full description of the service performed. Your letter must be postmarked not later than January 3, 1955.

**BASIS FOR JUDGING.** All entries will be reviewed by a group of distinguished and impartial judges. Their decisions will be based on (1) the greatest benefit to an individual or group, (2) the amount of ingenuity and sacrifice displayed in performing the service. The judges will be:

**E. ROLAND HARRIMAN**, President, The American Red Cross

**VAL PETERSON**, Administrator, Federal Civil Defense Administration

**EDWARD M. WEBSTER**, Commissioner, Federal Communications Commission

**GOODWIN L. DOSLAND**, President, American Radio Relay League

**WINNER WILL BE ANNOUNCED** on or before Thomas A. Edison's birthday, February 11, 1955.

Employees of the General Electric Company may nominate candidates for the Edison Radio Amateur Award, but are not permitted to receive the Award.



**GENERAL**  **ELECTRIC**

160-105



# ENGINEERING NOTES FROM :SSB

**T**he impact of single sideband is now being felt all over the world. It has opened up an entirely new field for the phone operator and, at the same time, has offered the promise of relieving, to a considerable extent, the highly congested phone bands. SSB presents many advantages over existing systems that just cannot be obtained by any other means. Most of these advantages have been discussed at length in the literature but because of their importance, we would like to repeat some of them here for emphasis. The principle advantages are, of course, the narrower bandwidth required for a voice communications channel and the effective power gain. The amount of improvement achieved by these advantages depends on many factors. Some of these factors are: (1) the actual "talking" power used in the systems being compared, (2) the propagation characteristics over the communications path, (3) the bandwidths of the systems being compared, to mention only a few. Because of these varying conditions, there is no single number that can be used to indicate the relative advantage of single sideband over amplitude modulation (AM). It can be shown that the relative advantage will vary between approximately 3 and 12 db depending upon the conditions under which they are compared. The advantages, however, are real and can be utilized to provide more effective phone communications in the crowded amateur bands.

While much has been said about SSB and its advantages, little has been said about the actual performance characteristics of the SSB communications circuit. Just what performance is obtainable and what are the limiting factors? The characteristics with which we are most concerned are the transmitted bandwidth, distortion and spurious radiations.

A "filter" type SSB exciter using the mechanical filter automatically limits the bandwidth of the transmitted signal without any additional filtering, and permits maximum use of our available frequencies. An audio bandpass filter would be required in a "phasing" SSB exciter to assure limiting the transmitted bandwidth to the same extent. Unless this is done, the higher audio frequencies will be transmitted and will cause interference in adjacent channels. Practice has shown that a transmitted bandwidth of

approximately 3500 cps is satisfactory for communications circuits. Anything greater than this just uses more of our spectrum and produces little or no additional intelligibility.

Distortion is generally associated with the operating conditions of linear amplifiers. To maintain good linearity, of course, it is necessary to use the proper operating voltages and to limit the plate voltage swing to the linear portion of the grid voltage-plate current curve. You simply cannot "soup-up" the amplifier or drive it harder to get more output because the distortion will increase rapidly as you approach the non-linear portions of the  $E_g-I_p$  characteristic curve. When discussing power output, we must include distortion to properly define our performance characteristics. It is essential that we do not overdrive linear stages and produce excessive distortion. Under proper conditions, it is possible to keep the 3rd order distortion products down as much as 35 to 40 db. If we overdrive stages in an attempt to "get the most out" the 3rd order distortion products may be down only as little as 6 to 10 db. This amount of distortion will cause considerable adjacent channel interference. Perhaps we should consider our maximum distortion level to be at least 25 db below the desired signal.

In producing SSB signals, it is necessary to use frequency mixing systems to get to the desired output frequency. Considerable care must be used in choosing the correct frequencies for mixing in order to avoid generating undesirable spurious signals. Considerable filtering (numerous hi-Q tuned circuits) are required to reduce the level of the spurious signals generated in frequency mixers. Frequency mixing systems should not be used having lower than 5th order mixer products. Enough filtering should be used to keep the spurious responses (mixer products) at least 60 db down. This may mean as many as 3 or 4 tuned circuits with Q's of between 75 and 100.

A well-designed "filter" type SSB exciter, using the 455C-31 mechanical filter, will provide these many advantages and will give the amateur the full improvement to be expected from a single sideband communications circuit.

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## Again, Two New Leaders Bear a Famous Brand\*

We're proud of our name and the twenty years of electronic leadership it represents. Our brand new communications line is in keeping with the high standards we have always maintained. Hallicrafters respects the recognition it has achieved by never compromising quality for price or sacrificing craftsmanship for mass production. These new models are the ultimate in precision-built communications equipment.

W. J. Halligan

Bielhalligan, Jr.



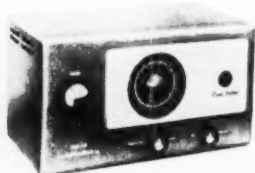
This new receiver reflects the dependable performance of 500,000 Hallicrafters radios with basically this chassis now in the field. Covers Broadcast Band 540-1650 kc plus three short-wave bands from 1650 kc—32 Mc. Electrical bandspread operates over large, easy-to-read dial. Headphone tip jacks on rear and built-in FM speaker. Oscillator for reception of code signals.

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These two new Civil Patrol receivers replacing the popular S-81 and S-82 are over ten times as sensitive, have greater increased audio power output, and include an extremely reliable *built-in relay squelch system*. This type of squelch system *completely* disables the entire audio system so that not a murmur is heard from the speaker until a signal is received making the unit perfect for monitoring of police, fire, taxi, mobile-telephone, forestry, civil defense. The S-94 covers from 30—50 Mc and the S-95 from 150—173 Mc. Built-in speaker and provisions for headphones. Gray steel cabinet with silver trim panel and red pointer.  $12\frac{5}{8}$ " x 7" x  $7\frac{1}{4}$ ". Shipping weight approximately  $12\frac{1}{2}$  lbs. Eight tubes plus rectifier. 105/125 V. 50/60 cycle AC/DC \$59.95



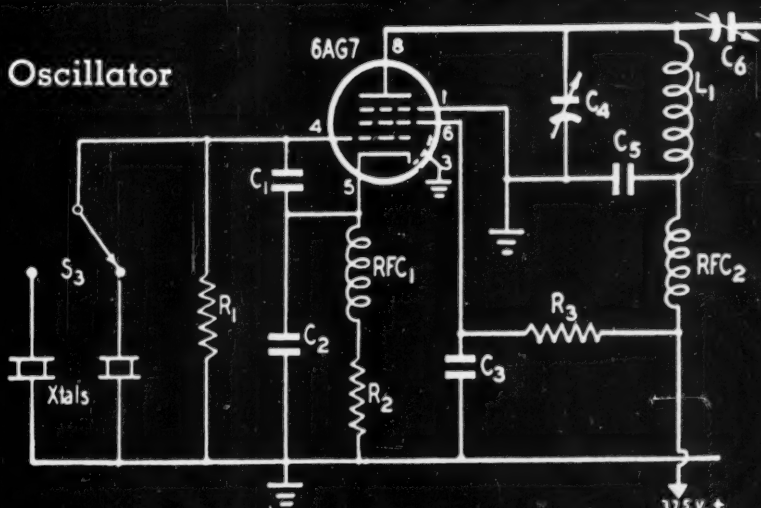
Model S-94 (S-95)



CHICAGO 24, ILLINOIS

\* **hallicrafters**

## Oscillator



C1—15-uufd. mica

C2—50-uufd. mica

C3—0.002-uufd. mica

C4—100-uufd. variable

C5—500-uufd. mica

C6—7 to 35-uufd. variable

R1—68,000 ohms, 1/2 watt

R2—500 ohms, 1 watt

R3—47,000 ohms, 1 watt

RFC1, 2—2.5-mh. choke

S3—S.p.d.t. snap switch

L1—(see text below)

## FOUR BAND COVERAGE with **ONE** PR Crystal!

Never underestimate the driving power of a crystal oscillator . . . providing you have the right circuit and the right crystal. Here's one that will give ample output on 40, 20, 15 and 10 meters, utilizing a low-cost PR 7 MC. Crystal! It will drive a 2E26 or even an 807 clear down to 10 meters. The circuit is not tricky. Crystal oscillates at all times regardless of whether plate circuit is at resonance. The inductance L1 should resonate at the frequency on which output is desired. Do not substitute another tube for the 6AG7. Use a minimum of 375 volts and as high as 390 volts for best results when doubling, tripling or quadrupling. Try this oscillator. Addition-

al copies of the circuit may be obtained from your PR Jobber, or directly from the factory.

You can get high-quality, low-cost PRs for all amateur bands (exact integral frequency) at no additional cost. It's good to know where you are with a PR! They're unconditionally guaranteed!



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## Section Communications Managers of the ARRL Communications Department

**Reports Invited.** All amateurs, especially League members, are invited to report station activities on the first of each month (for preceding month) direct to the S.C.M., the administrative ARRL official elected by members in each Section. Radio club reports are also desired by S.C.M.s for inclusion in QST. **ARRL Field Organization station appointments** are available in the areas shown to qualified League members. These include ORS, OES, OPS, OO and ORS. S.C.M.s also desire applications for SEC, EC, RM and PAM where vacancies exist. *All amateurs in the United States and Canada are invited to join the Amateur Radio Emergency Corps (ask for Form 7).*

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☐ Ham (call letters \_\_\_\_\_) ☐ Listener

Occupation \_\_\_\_\_

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*Bird Halligan, Jr.*



# THE AMERICAN RADIO RELAY LEAGUE, INC.,

is a noncommercial association of radio amateurs, bonded for the promotion of interest in amateur radio communication and experimentation, for the relaying of messages by radio, for the advancement of the radio art and of the public welfare, for the representation of the radio amateur in legislative matters, and for the maintenance of fraternalism and a high standard of conduct.

It is an incorporated association without capital stock, chartered under the laws of Connecticut. Its affairs are governed by a Board of Directors, elected every two years by the general membership. The officers are elected or appointed by the Directors. The League is noncommercial and no one commercially engaged in the manufacture, sale or rental of radio apparatus is eligible to membership on its board.

"Of, by and for the amateur," it numbers within its ranks practically every worth-while amateur in the nation and has a history of glorious achievement as the standard-bearer in amateur affairs.

Inquiries regarding membership are solicited. A bona fide interest in amateur radio is the only essential qualification; ownership of a transmitting station and knowledge of the code are not prerequisite, although full voting membership is granted only to licensed amateurs.

All general correspondence should be addressed to the administrative headquarters at West Hartford, Connecticut.



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# "It Seems to Us..."

## QST, VOLUME I

Beginning on page 42 of this issue we publish the first in a series of several articles summarizing the contents and flavor of the early volumes of *QST*. The casual style and selection of interesting highlights make, we think, for easy reading despite their strictly factual and documentary basis. No one would suspect that behind their preparation lies one of the most prodigious and laborious tasks of research and analysis, accomplished solely as a matter of personal interest, ever to come to our attention.

The researcher-author is Sumner B. (Ted) Young, W0CO, a real old-timer with a string of "ex" calls and now a Minneapolis corporation attorney. In 1951, recovering from an illness, he spent much of his convalescent time poring over early *QST*s, of which he has collected several complete sets in bound volumes. For his own personal use he decided to compile a volume of photostats of the column "Twenty Five Years Ago in *QST*." Thinking ahead to the next step, he planned to embark on a project of producing an elaborate index of the first five volumes of *QST*. His letters to us at that time included the following comments:

Professional men are well aware of the usefulness of an index as a working tool. As a lawyer, I work with indexes a good deal and my attitude toward law books is that without a good index they are next-door to worthless.

*QST* is a veritable mine of interesting and valuable material on the history of amateur radio. . . . [but] *QST* is a difficult publication to index. Facts hide out in the most unexpected places. They are numerous, and are spread about in illogical array. Articles are only a few pages long. Indexing, both by call letters and by names, is essential. Cross-indexing must be accomplished, in various ways, to insure the finding of items, later. Indexing things by their titles would tell only about one-tenth of what each issue really contains. . . .

It is surprising to see how facts of interest and importance have a way of showing up, in unexpected places, in *QST*. It is amazing, also, to discover what a large volume of material is encompassed in what looks to be a rather small number of printed pages. . . .

And despite the small number of printed pages in those first issues, the extent of the cross-indexing job Ted Young has done is almost incredible. We might not believe it, had we not seen the working materials ourselves. Thousands upon thousands of 3 x 5 file cards,

each containing an index heading, the subject and other cross reference, were handwritten — then sorted by classifications, and recopied by hand for typing a master page. The file drawers occupy almost as much space at W0CO as the transmitters, and that's saying something! The fact that the job has taken all his spare time for the past several years is indicative of the mountainous task involved.

At this point Ted had completed a job unexcelled for reference work, but about as interesting to read as the telephone directory. In poring over old *QST*s, however, he had reabsorbed a great deal of the flavor of amateur radio in those early days, and when he finished Volume IV he sat down to write a brief foreword setting forth the highlights. After we had seen a copy, we found it such pleasant reading that we asked him to go back and do forewords for the previous three volumes, to which he consented.

To the researcher and historian of those early days, the index will be of inestimable value; to the more casually interested among us, the foreword serves as a guide to many buried wonders. So step with us, if you will, both Old Timer and Novice — those who long to hear again the horrendous whine of a rotary gap, and those just recently introduced to ham radio — back into the pages of history. It is December, 1915, and here is *QST*, Volume I.

## SINGLE SIDEBAND

The League Hq. takes pleasure in announcing the preparation of a new ARRL publication, *Single Sideband for the Radio Amateur*, out later this month — the first addition to the ARRL library of publications in more than a dozen years.

Just seven years ago W6YX and W0TQK started the current swing to "s.s.s.c." with their history-making 14-Mc. communication. *QST* has plugged as hard as it could for the new mode, often in the face of severe criticism from the present 'phone gang, reminiscent of the spark-c.w. feuds of the Twenties. Single sideband has grown, mightily. For several years now we've periodically examined the possibility of a special publication for the s.s.b. gang; each time it appeared premature (though of course less so each year), and that *QST* and the *Handbook* could do an adequate

job. At the 1954 ARRL Board meeting in May the subject of an s.s.b. book was discussed informally, further confirming growing membership interest. What tipped the scales to start the project was the appearance at the Trade Show in Chicago in late May of a surprising number of new s.s.b. units and gadgets manufacturers are bringing out this year, whereas up until now only a small amount of gear has been available, and the probability of a marked upsurge of s.s.b. interest as a result.

When an examination of the material in *QST* the past few years showed coverage of the field surprising even to us in its completeness, we decided to build the book largely on those articles, adding only such other material as was necessary to make a practical handbook of current techniques. We think it shapes up as a mighty useful addition to any amateur shack.

## ARRL Conventions

### MIDWEST DIVISION

**Des Moines, Ia. — Oct. 16th-17th**

The ARRL Midwest Division Convention in Des Moines, Ia., October 16th-17th, will feature colored movies and slides of the famed Clipperton Island expedition. Sponsor of the convention is the Des Moines Radio Amateur Association. The convention site is Hotel Fort Des Moines, where displays will be set up and meetings held for special groups as well as conventioners as a whole. Main speaker will be Ed Tilton, WHDQ, *QST*'s v.h.f. editor.

The convention fee is a reasonable \$7.50 — or only \$7 if you preregister (fee includes the cost of two big meals, to be served at the hotel). For information on registrations and reservations write the Rev. Duane Farris, 1210 63rd St., Des Moines, Iowa.

### NEW ENGLAND DIVISION

**Manchester, N. H. — Oct. 10th**

The Manchester Radio Club, sponsors of the 1954 ARRL New England Division Convention, are preparing to welcome 3000 hams to the time of their lives. The convention will be held Sunday, October 10th, at the State Armory, Manchester. Starting time is 9 A.M.

A chockfull program is planned, highlighted by demonstrations of single sideband, radioteletype, and amateur television. Some of the other activities are ARRL functions, net meetings, special YL and Novice doings, novel contests, mobile-transmitter hunts, equipment demonstrations, continuous technical-nontechnical films, etc. Nothing is being spared to provide the very best in exhibits, speakers and banquet. Free parking for 1000 cars.

Banquet \$5.00 — general admission \$3.00. For advance tickets, hotel-motel reservations: Cleo Beauchamp, W1SLJ, 386 Reed St., Manchester,

New Hampshire. *Notice to clubs and parties:* Special party table reservation tickets in blocks of ten — \$50.00 (advance sale only).

Meet us at Manchester!

### ROANOKE DIVISION

**Richmond, Va. — Oct. 30th-31st**

The Richmond Amateur Radio Club is sponsoring the ARRL Roanoke Division Convention, to be held the week end of October 30th-31st in Richmond, Virginia. The location will be historic Hotel Jefferson in the heart of the city.

Informal get-togethers will be the order of business Friday night, October 29th, with local hams as hosts. Saturday registration will start at 9 A.M. with the program getting under way at 10. Special emphasis this year is being placed on technical subjects. Director Anderson will preside at a series of special meetings on subjects including SCM and EC activities.

Saturday evening will begin with a banquet at 7 o'clock in the hotel ballroom. The evening will be climaxed by dancing beginning at 9:30 to the music of Burt Repines orchestra. Sunday morning will be mobile assembly time at the park and "Bon Voyage."

The Hotel Jefferson has set aside a block of rooms for the convention. Room reservations should be made direct, mentioning the Richmond Amateur Radio Club. Advance registrations for convention activities should be sent to Howard Lipsius, W4OSB, Secretary, RARC, P. O. Box 1985, Richmond 16, Virginia. Registration fee, \$6.50, includes banquet and dance.

## HAMFEST CALENDAR

**DISTRICT OF COLUMBIA** — Greater Washington Area Hamfest, Sunday, October 3rd, at Palisades Park. This hamfest is sponsored by the Washington Mobile Radio Club and all profits will be given to the Washington Television Interference Committee. Program begins at 11 A.M.; dinner between 2 P.M. and 4 P.M. Games and free cokes. Pre-registration tickets \$2.25, including dinner — \$1.00 without. Children's tickets \$1.50 with dinner — 50¢ without (children 6 to 12 years). For tickets and information contact Ethel Smith, W3MSU.

**ILLINOIS** — Society Radio Operators, Chicago, will hold a Halloween Dance and Cabaret Party at their new clubhouse, 6038 No. Cicero Ave., Oct. 29th, starting at 9 P.M. Tickets \$1.50. All are welcome.

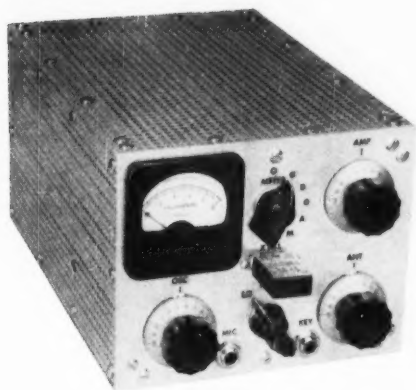
**LOUISIANA** — The Caravan Club of Louisiana is holding its first annual Hamfest near Shreveport, La., November 14th. There will be plenty of games, exhibits and activities to interest the YLs, XYLs, junior ops and OMs alike. Advance reservations should be addressed to R. C. Herrlin, 469 Adams Ave., Shreveport, La. Advance reservations for adults \$1.50, children \$1.00 (\$2.00 and \$1.25 at the gate).

**NEW YORK** — All Western New York radioamateurs, young and old, commercial and amateur, are invited to attend the 3rd annual Old Timers' Nite at the Doud Legion Post, Buffalo Road, Rochester, N. Y., Friday, Oct. 22nd. A full-length program is scheduled with a buffet supper at 7 P.M. (\$1.85). Outstanding speakers, huge exhibit of antique wireless equipment including several spark transmitters, etc. Mail postcard stating number attending for buffet supper to: Bruce Kelley, W2ICE, Chairman, Union & Stony Point Rd., Rochester 11, N. Y.

**NEW YORK** — Federation of Long Island Radio Clubs will hold its annual Hamfest on Friday evening, October 15th, 8 o'clock, at the Lost Battalion Hall, 93-29 Queens Blvd., Elmhurst, L. I. There will be exhibits, exceptional music for dancing, and areas set apart to meet special ham

(Continued on page 146)





Front view of the 6-band mobile transmitter. The control knob for  $S_2$  is located between the meter and the dial for  $C_3$  and  $C_4$ .  $S_1$  is directly below the crystal socket, with the knobs for  $C_2$  and  $C_5$  to the left and right, respectively.  $J_1$  and  $J_2$  are at the bottom of the  $4\frac{7}{8} \times 6\frac{1}{4}$ -inch panel. The perforated aluminum cover is  $9\frac{1}{16}$  inches deep and has a hole punched in the left side to permit adjustment of  $C_1$ .

## An R.F. Assembly for Mobile or Fixed-Station Work

*Ganged Multiple-Circuit Tuners in a Six-Band Rig*

BY C. VERNON CHAMBERS,\* W1JEQ

**A**LTHOUGH many home constructors lay honest claim to a strong anticommercial attitude toward transmitting gear, it must be admitted that more than one sometimes cast admiring eyes at the neat mobile packages available on the market. Most manufactured units certainly have eye appeal, and a compactness that is difficult to duplicate in the home workshop. The ability to produce rigs of such small dimensions is not difficult to understand if one examines the interior of one of these units. Here one will find many special fittings and components of miniature size that are not available to the average ham. However, the ham who likes to roll his own may not be too concerned about saving the last cubic inch of space if he gets the sort of performance and convenience he wants.

The mobile transmitter shown in the photograph represents a practical compromise between commercial standards of compactness and those which can conveniently be met in the home workshop by a ham with average skill in construction. Its chief attributes are as follows:

- 1) No power output has been sacrificed for the sake of miniaturized construction, yet it is compact enough to fit in a convenient spot under the instrument panel.
- 2) Six-band coverage is accomplished employing neither plug-in coils nor complicated r.f. switching. The only r.f. switch is a simple one that selects one of two output links. Band-changing, in some instances, requires the readjustment of only a single control.
- 3) Through the use of ganged condensers, two circuit-resonating controls are needed.
- 4) Construction is straightforward and does

not require the use of special components or hardware that is difficult to make.

5) The transmitter will work satisfactorily from almost any practical mobile power supply.

6) The unit can easily be removed from the car to the home-station operating table, and be operated with the final running at full rated input—90 watts c.w. (or 65 watts 'phone with a suitable modulator).

There were reasons why it was believed not entirely desirable to include the modulator in the r.f. unit. In the first place, of course, space under the dash is usually at a premium, so the dimensions of a unit intended primarily for mounting in this location should be minimum. There is negligible disadvantage in placing a separate modulator unit where more space is available. Another point is that it is practically impossible to design an audio section that will work satisfactorily and economically over a wide range of plate voltages and power-output levels. It is preferable that the design of the modulator be based on the available power supply.

### The Circuit

The circuit of the transmitter, Fig. 1, shows an r.f. line-up consisting of a grid-plate crystal oscillator followed by a multiplier-driver stage and a 6146 power amplifier. The oscillator employs a 5763 tube,  $V_1$ , uses 3.5-, 6-, or 7-Mc. crystals, depending on the output frequency desired, and has a parallel-feed plate circuit tuned by  $C_2$  and  $L_1$ . This stage ordinarily is operated at the crystal frequency, but it can also be tuned as a frequency multiplier to the second harmonic of 3.5-Mc. crystals if such operation becomes desirable. Feed-back can be adjusted by  $C_1$  to suit crystals

\* Technical Assistant, QST.

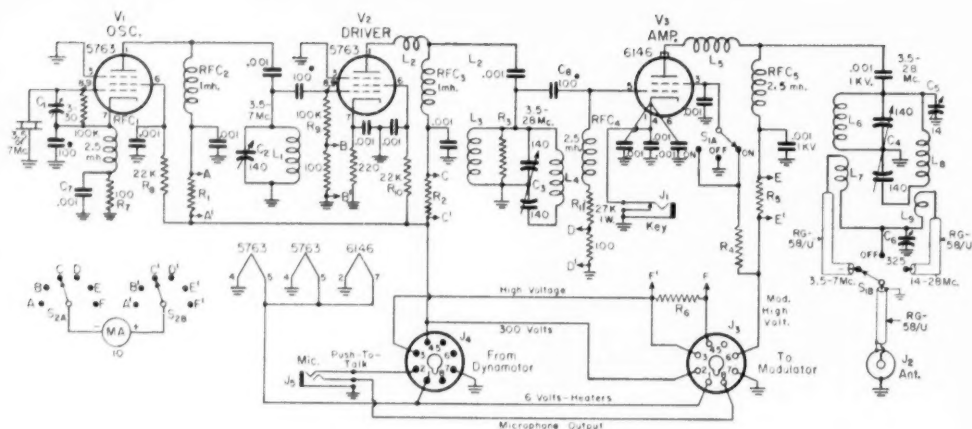


Fig. 1 — Wiring diagram of the six-band mobile transmitter.

- $C_1$  — 3-30- $\mu$ fd. trimmer.  
 $C_2$  — 140- $\mu$ fd. variable (Hammarlund MC-140-S).  
 $C_3, C_4$  — 140- $\mu$ fd. per-section variable (Hammarlund MCD-140-M). (Ganged to single control.)  
 $C_5$  — 14- $\mu$ fd. midget variable (Johnson 15M11).  
 $C_6$  — 325- $\mu$ fd. variable (Hammarlund MC-325-M).  
 $R_1, R_2$  — 5-times meter shunt; 60 inches No. 34 enameled, scramble-wound on 1-megohm,  $\frac{1}{2}$ -watt resistor.  
 $R_3$  — See text.  
 $R_5, R_6$  — 25-times meter shunt; three 32  $\frac{1}{2}$ -inch lengths No. 34 enameled, connected in parallel and scramble-wound on 1-megohm,  $\frac{1}{2}$ -watt resistor.  
 $L_1$  — 11  $\mu$ h; 43 turns No. 24,  $1\frac{1}{16}$  inches long,  $\frac{5}{8}$ -inch diam. (B & W 3008).  
 $L_2$  — Parasitic choke; 4 turns No. 16,  $\frac{1}{4}$ -inch diam., turns spaced wire diam.  
 $L_3$  — 6  $\mu$ h; 20 turns No. 24,  $\frac{5}{8}$  inch long,  $\frac{3}{4}$ -inch diam. (B & W 3007).  
 $L_4$  — 2.85  $\mu$ h; 21 turns No. 20,  $1\frac{1}{16}$  inches long,  $\frac{5}{8}$ -inch diam. (B & W 3007).  
 $L_5$  — Parasitic choke; 6 turns No. 16,  $\frac{1}{4}$ -inch diam., turns spaced wire diam.  
 $L_6$  — 6  $\mu$ h; 20 turns No. 20,  $1\frac{1}{16}$  inches long, 1-inch diam. (B & W 3015).

- $L_7$  — 5.2  $\mu$ h; 18  $\frac{1}{2}$  turns No. 24,  $\frac{3}{16}$  inch long,  $\frac{3}{4}$ -inch diam. (B & W 3012).  
 $L_8$  — 2.85  $\mu$ h; 16  $\frac{1}{2}$  turns No. 20, 1 inch long,  $\frac{3}{4}$ -inch diam. (B & W 3011).  
 $L_9$  — 0.4  $\mu$ h; 4 turns No. 20,  $\frac{1}{4}$  inch long,  $\frac{3}{4}$ -inch diam. (B & W 3011).

NOTE: See text for additional data on  $L_8$  and  $L_9$ .

- $J_1$  — Midget closed-circuit jack.  
 $J_2$  — Coaxial-cable connector (Amphenol 83-1R).  
 $J_3$  — 8-prong female connector (Amphenol 78-S8).  
 $J_4$  — 8-prong male connector (Amphenol 86-CP8).  
 $J_5$  — Midget 2-circuit microphone jack.  
 $MA$  — 0-10-ma. d.c. meter (Simpson Model 127).  
 $S_{1A}$  — 1-pole 6-position (3 used) selector switch (Centralab PA-1).  
 $S_{1B}$  — 1-pole 11-position (3 used) selector switch (Centralab PA-11).

NOTE:  $S_{1A}$  and  $S_{1B}$  mounted on Centralab PA-300 index assembly.  
 $S_2$  — 2-pole 6-position selector switch (Centralab PA-2003 or PA-3 section on PA-300 index).

Unless otherwise specified, all resistors are  $\frac{1}{2}$  watt, and all fixed capacitors are disk ceramic.

\* Indicates a mica capacitor.

of varied activity. Cathode bias protects the tube in the event of crystal failure. Output from the oscillator is capacity-coupled to the grid of  $V_2$ .

While it might be possible to cover all six bands with the oscillator and final alone, a multiplier stage is included. This not only permits the final to be used as a straight amplifier on all bands, but it makes it unnecessary to push the oscillator to the limit to secure adequate drive. As it is, the two exciter tubes loaf along at a total plate current of about 18 ma.

The multiplier stage also employs a 5763,  $V_2$ , uses parallel plate feed, and is tuned to resonance by a 6-band tuner consisting of  $C_3$  and inductors  $L_3$  and  $L_4$ .<sup>1</sup> Cathode bias is used in this stage not only to protect the tube, but also to limit the input to only that necessary for adequate drive to the final. Plate current is approximately 10 ma.  $L_2$  is used to suppress v.h.f. parasitic oscillation.

A resistor,  $R_3$ , connected across  $L_3$  of the tuner, serves three useful purposes. First, it helps to

level off the drive to the final amplifier. In particular, it reduces the output of the driver at the lower frequencies where there is otherwise an overabundance of drive. Its effect on drive at the higher frequencies is relatively small. Second, it effectively broadens the response of the tuner at the lower frequencies, thus simplifying the problem of tracking this circuit with the one in the final. And last, but by no means least, the addition of  $R_3$  is an important aid in stabilizing both driver and final at the lower frequencies where all three stages may be operating at the same frequency.

A 6146 was selected for the amplifier, principally because it is one of the few tubes that works well over a wide range of plate voltages. It will perform just about as efficiently at low voltages as it does at its maximum rating. Thus, the input can be adjusted to suit the available power supply and modulator. Parallel plate feed is used in this stage, too, and the output circuit is resonated with a multiband tuner,  $C_4$ - $L_5$ - $L_6$ , similar to the one in the driver stage with which it is ganged to a single control.  $C_5$  is a trimmer to aid in the

<sup>1</sup> Chambers, "Single-Ended Multiband Tuners," QST, July, 1954.

tracking adjustment.  $L_6$  is a v.h.f. parasitic choke. A keying jack,  $J_1$ , is provided for those who may want to work c.w., either mobile or at a fixed station.  $S_{1A}$  in the screen circuit holds the input to a safe value (almost zero plate current at 450 volts) during periods of tune-up or testing.

Two link coils,  $L_7$  and  $L_9$ , are required to provide proper output coupling.  $L_7$  is used for output at 3.5 or 7 Mc., while  $L_9$  takes care of the remaining bands. The proper link coil is selected by  $S_{1B}$ . Although, for the sake of clarity, this switch is shown as a simple selector switch, actually, the one specified in the parts list is one that not only disconnects the unused coil, but short-circuits it as well. The link circuit is tunable by means of  $C_6$ , and this provides a means of adjusting the loading on the final. This output circuit is designed to feed into 50-ohm coax cable.

#### Power and Metering Circuits

A 10-ma. meter can be switched by  $S_2$  to check the plate current of each stage, or the grid current of each of the last two stages.  $R_1$  and  $R_2$  multiply the meter reading by 5 to give a full-scale reading of 50 ma. Similarly,  $R_3$  and  $R_4$  multiply the reading by 25 for a full-scale reading of 250 ma. The values specified for the shunts will hold only for the meter specified, or one of the same internal resistance.

Two connectors,  $J_3$  and  $J_4$ , are provided at the rear of the chassis.  $J_3$  takes a cable from the modulator unit, while  $J_4$  is for a cable from the power-supply unit. On  $J_3$ , the speech input terminals of the modulator unit should be connected across Pins 7 and 8. The secondary of the modulation transformer should be connected across Pins 3 and 6. The hot side of the audio filaments should be connected to Pin 1, and the high-voltage input terminal of the modulator to Pin 4. With the latter connection, the meter will read modulator plate current when the meter switch is in the  $F$  position.

<sup>2</sup> Data pertaining to the availability of perforated aluminum are presented on page 38, *QST*, June, 1954.

For the plug that fits into  $J_4$ , the winding of the push-to-talk relay should be connected across Pins 1 and 2. The positive high-voltage lead from the power unit should connect to Pin 3, and the hot side of the car battery should connect at Pin 1. If the power supply delivers 300 volts or less, Pins 3 and 4 should be connected together. If the power supply delivers appreciably more than 300 volts, a series-dropping resistor, of suitable value to bring the voltage at Pin 4 down to 300 volts, should be connected between Pins 3 and 4, instead of the short.

#### Construction

Three types of aluminum—plain sheet, perforated sheet, and angle stock—are used in the construction of the transmitter.<sup>2</sup> The specifications for the material used are as follows:

Alcoa 28H-14 aluminum sheet, 0.064 inch thick:

Panel— $4\frac{7}{8}$  by  $6\frac{1}{4}$  inches

Chassis plate— $5\frac{31}{32}$  by 9 inches

Partition (see top view)— $5\frac{31}{32}$  by 3 inches

Rear connector bracket (see bottom view)— $6\frac{3}{4}$  by 2 inches

Perforated aluminum sheet for cover, 0.051 inch thick:

2 pcs. (top and bottom)— $6\frac{1}{4}$  by  $9\frac{11}{16}$  inches

2 pcs. (sides)— $4\frac{3}{4}$  by  $9\frac{11}{16}$  inches

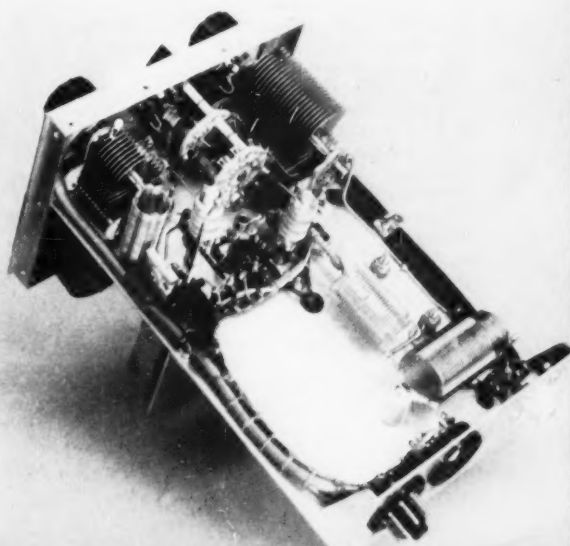
1 pc. (rear)— $4\frac{3}{4}$  by  $6\frac{1}{8}$  inches

Angle stock: Approximately  $7\frac{1}{2}$  feet,  $\frac{1}{2}$  by  $\frac{1}{2}$  by  $\frac{1}{16}$  inch

The photographs show how the chassis and panel have been constructed as a unit that slides into the perforated cover. A layout of the panel is shown in Fig. 2. A rear-view plan is shown so that the constructor may make markings directly on the metal without disfiguring the front surface.

Lengths of angle stock, drilled and tapped to accommodate machine screws, are fastened along the four edges of the panel, on the inside. The strips of angle must be set in from the edges of the panel by the thickness of the cover material. The angles are fastened to the back of the panel

In this bottom view of the mobile transmitter,  $C_2$  and  $C_6$  are to the left and the right, respectively, of  $S_1$ .  $S_{1A}$  is the section closest to the panel.  $L_1$  (mounted on a  $\frac{1}{2}$ -inch cone insulator),  $C_1$  and  $RFC_2$  form a triangle to the rear of  $C_2$ . The plate-circuit feed-through,  $RFC_3$ , and the tube socket—all for  $1_2$ —are to the rear of  $S_{1B}$ .  $L_6$  and  $L_7$  are mounted parallel with the rear of the chassis and the  $L_8$ - $L_9$  assembly is supported by feed-through insulators above and to the left of  $L_6$ .  $J_2$ ,  $J_3$  and  $J_4$  are mounted on an aluminum bracket shown at the bottom of the photograph.



• Here is a rugged r.f. unit that fulfills most of the mobile fan's needs. Compactness; rapid band-changing without plug-in coils, complicated tracking or involved r.f. switching; a minimum of tuning controls; and full consideration of the ever-present mobile power-supply problem are several features which make this unit a mobile-man's all-purpose rig. And, of course, there is nothing to prevent using the transmitter for fixed-station or portable-emergency use operating the 6146 final at full rated input.

by 6-32 screws in the No. 28 holes skirting the edges of the panel. The two pieces that meet at the upper right-hand corner (Fig. 2) must be filed out to clear the round case of the meter. They must also be drilled to clear the No. 4 screws used to mount the instrument.

Holes marked *A* and *B* are used for fastening a  $5\frac{1}{4}$ -inch length of angle across the back of the panel to serve as a support for the front edge of the chassis plate. The holes in the angle should be located so that the top surface of the chassis plate will be  $2\frac{3}{4}$  inches up from the bottom edge of the panel. The chassis plate must be notched so that its front edge will fit flush against the back of the panel.

Before attaching anything permanently to the chassis or panel, the partition on which the 6146 is mounted should be made. The partition is made from the  $5\frac{1}{4} \times 3$ -inch piece of aluminum. Bend a  $\frac{3}{4}$ -inch mounting lip along the bottom edge, and then clip or round off the two top corners to clear the cover when it is slipped on.

Now fasten the chassis-supporting angle to the panel. Slip the front edge of the chassis plate over the angle, and hold it there while you slide the partition up against the back of the panel, keeping the bottom lip of the partition tight against the chassis. Then, using the panel as a template, scribe a hole in the partition that matches hole *C* (Fig. 2) in the panel. This will guarantee that the shaft hole in the panel and the one in the partition will line up accurately.

Notch out the mounting lip of the partition to clear the ceramic base of the rear tuning condenser when the latter is mounted.

The 6146 socket is centered on the partition

with its mounting holes in a vertical line, and the grid terminal to the left as viewed from the rear of the partition. The socket is mounted on  $\frac{3}{4}$ -inch tubular spacers. A  $\frac{1}{2}$ -inch clearance hole should be drilled in the partition opposite the grid terminal. Considerable time will be saved if the disk ceramics and leads connecting to the socket are attached and soldered before the socket is mounted permanently.

The partition is placed  $4\frac{3}{8}$  inches from the panel, and another  $\frac{1}{2}$ -inch hole, lined with a rubber grommet, is drilled in the chassis, directly below the socket, to pass filament, cathode, and screen leads.

The bracket that supports  $J_2$ ,  $J_3$  and  $J_4$  (see bottom view) should now be fabricated. Use the  $2 \times 6\frac{3}{4}$ -inch piece of aluminum. The bracket has a  $\frac{3}{8}$ -inch mounting lip bent up along one side, and  $\frac{3}{4}$ -inch braces bent up at the ends. A neater job will result if the ends of these braces are cut diagonally. The finished height of the bracket should be  $1\frac{1}{2}$  inches. Placement of connectors on the bracket is not especially critical, and can be estimated from the bottom view. When the bracket is finally mounted, it is held in place by machine screws that pass through the chassis and then thread into a 5-inch length of angle centered along the edge, on the opposite face of the chassis plate.

The remainder of the layout work can be done most easily by the following procedure: Temporarily mount the panel components, and the partition, with the 6146 inserted in its socket, and the amplifier tank capacitor,  $C_4$ , in place. Scribe lines on the chassis, along the inner edges of the ceramic bases of  $C_3$  and  $C_4$ , across the rear of  $C_4$ , and mark hole centers directly under the inside stator terminals of the condenser  $C_4$ . The latter will indicate the positions of the feed-through insulators that support  $L_8$  and  $L_9$  (see

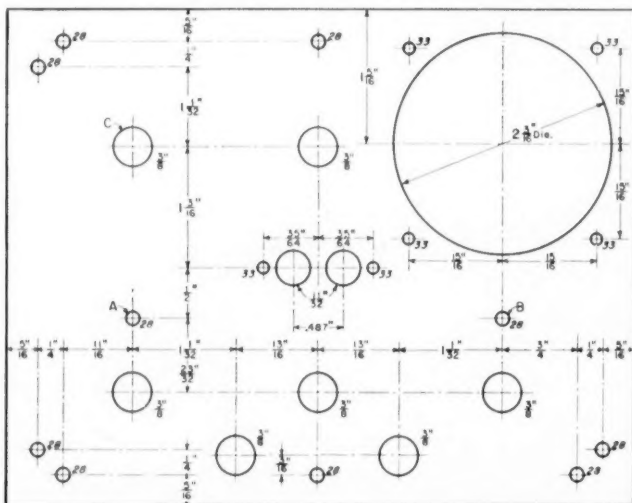
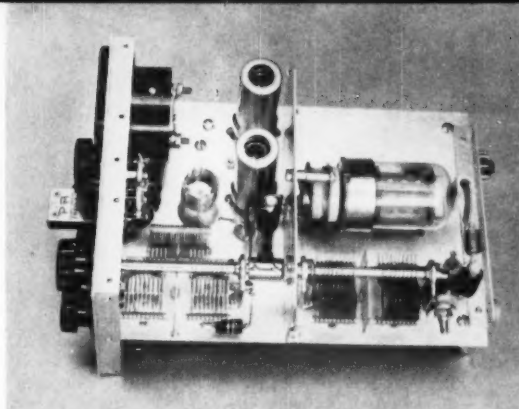


Fig. 2—Layout drawing of the panel (rear view) for the six-band mobile transmitter.

As seen in this top view of the mobile transmitter,  $V_1$  is located to the right of the milliammeter, just above  $I_2$ .  $L_3$  is mounted on a 1-inch cone insulator to the right of  $S_2$ , and  $L_4$  is supported by the stator terminals of  $C_3$ .  $C_5$ ,  $R_{11}$  and  $RFC_4$  are grouped to the lower right of a feed-through insulator used for the plate lead of  $I_2$ . The 6146 is mounted on the right side of the aluminum partition, and  $L_5$ ,  $C_4$ ,  $C_2$  and  $RFC_3$  are in line below the tube. A metal coupling connects the shafts of the two multiband-tuner condensers in the foreground.  $R_3$  can be seen shunting the rear section of  $C_3$ .



bottom view). Now make marks on the chassis indicating the rearmost edges of all panel-mounted parts, and also draw a line across the chassis, holding the scribe against the front of the partition.

All components may now be removed from the chassis so that the positions of the tube sockets, r.f. chokes and other small components may be marked. The socket for  $V_1$  is centered  $3\frac{3}{16}$  inches back from the panel and  $\frac{3}{4}$  inch from the side of the chassis.  $V_2$  is centered  $1\frac{3}{4}$  inches below  $V_1$  (top view). Pins 4 and 5 of each socket should face toward the rear of the chassis.

A study of the photographs should clearly designate the positions of the components still to be mounted. In addition to the feed-through insulators for  $L_8$ - $L_9$ , and the plate lead of  $V_2$ , another must be provided for the lead between the crystal socket and  $V_1$ . Also, holes lined with rubber grommets should be provided in the chassis for the leads that connect to  $S_2$ ,  $RFC_4$ , and  $RFC_5$ .

Additional reminders that may be helpful are:

$L_1$  and  $L_3$  are fastened to their respective cone-insulator supports with Duco cement. Allow the cement to dry overnight before mounting these units.

A lug soldered to the last turn (plate end) of  $L_6$ , and then mounted on a  $\frac{1}{2}$ -inch cone insulator, provides support for this coil. The cold end of  $L_7$  is supported in a similar manner.

No. 12 tinned wire is used to support the plate end of  $L_8$ , and the  $C_4$  ends of both  $L_7$  and  $L_9$ .

The  $L_8$ - $L_9$  assembly is made from a single length of B & W Miniductor. Use a  $20\frac{1}{2}$ -turn length of Type 3011, and break the winding at 4 turns from one end, leaving the support bars intact. After heavy leads have been soldered to the four free ends of the assembly, mount and then wire as shown in Fig. 1.

The shafts of  $C_3$  and  $C_4$  are ganged with a metal coupler (Millen Type 39003).

$C_5$  is mounted on a bracket, 1 inch high, with a  $\frac{1}{2}$ -inch lip, made from a  $\frac{5}{8}$ -inch strip of aluminum.

For operation with a plate supply delivering between 300 and 450 volts, a 20,000-ohm 2-watt screen-dropping resistor ( $R_4$ ) works well. This value of resistance, with the appropriate wattage rating, can be most conveniently provided by mounting a pair of 10,000-ohm 1-watt resistors in series on the terminals of  $S_{1A}$ .

$R_3$  is a pair of 12,000-ohm 1-watt resistors connected in parallel and soldered between rotor and stator terminals of the section of  $C_3$  that connects to  $C_5$ .

A four-terminal tie-point strip to the rear of  $V_1$  and  $V_2$  connects to the B + ends of  $R_8$ ,  $R_{10}$  and  $RFC_2$ , and to the meter side of  $R_9$ . A single-terminal strip provides a junction point for  $C_7$ ,  $R_7$  and the oscillator cathode choke.

The five sections of the cover are held together by machine screws. These screws pass through the perforated aluminum and then thread into the lengths of angle that run along all closed edges of the cover. A cutout measuring  $1\frac{1}{16}$  by  $5\frac{1}{8}$  inches is made in the rear wall to provide clearance for the power and antenna connectors and their cables.

### Adjustment

If it is not convenient to use the mobile supply for initial testing of the transmitter, any a.c.-operated supply delivering between 300 and 450 volts at about 150 ma. may be used. If the voltage is higher than 300, it should be fed into Terminal 3 of  $J_4$ , and a dropping resistor connected between Terminals 3 and 4. This resistor should have a value of 50 ohms for each volt that the power supply delivers above 300 volts. Thus, a power supply delivering 350 volts should have a dropping resistance of  $50 \times 50 = 2500$  ohms. The negative terminal of the supply should be connected to Terminal 7 of  $J_4$ . Heater connections are made at Terminals 1 and 7 of  $J_4$ .

For 3.5- and 7-Mc. output, 3.5-Mc. crystals may be used, 6-Mc. crystals are used for 27-Mc. output, and 7-Mc. crystals may be used for 14-, 21-, and 28-Mc. operation. The oscillator output circuit may be resonated at any of these crystal frequencies by adjustment of  $C_2$ . If crystal operation appears to be sluggish,  $C_1$  should be adjusted for maximum activity. At 300 volts, the oscillator off-resonance plate current should be about 30 ma. (Remember that  $R_1$  increases the full-scale meter reading to 50 ma. when reading oscillator plate current.) At resonance, the plate current should drop to about 6 ma., and the grid current to  $V_2$  should simultaneously peak at 1.5 to 2 ma.

With excitation at the grid of  $V_2$ , the output circuit of  $V_2$  can be resonated by adjustment of

(Continued on page 118)



# A Step-by-Step Transmitter for the V.H.F. Man

## PART I — Getting Started at the 15- to 25-Watt Level

BY EDWARD P. TILTON,\* WIHDQ, AND MASON P. SOUTHWORTH,\*\* WIVLH

ONE outstanding virtue of v.h.f. operation is that it is one kind of hamming you can still do successfully with low power. As there is almost never a need to overpower other stations on the same frequency, you can do good work on 6 or 2 with 15 to 25 watts. Higher power pays off, of course, but if you want to start with low power and work up as time and finances permit, there's no better place to do it than on 50 or 144 Mc.

The three units shown herewith were designed to start the v.h.f. newcomer along that road. The two smaller ones are separate rigs of similar design for 6 and 2, that will work effectively as complete r.f. sections for either band. They can be keyed for c.w., or plate modulated for 'phone. Their total power requirements are low enough to permit economical mobile operation, if you want to use them in that way. They run conservatively at 15 to 25 watts input. If you never want to go higher than that, they'll do the job for you beautifully; but if you want to take the next step, to the 120-watt level, the third unit in the picture will be described in a subsequent issue. There's no need to stop there, either, for the two-band amplifier will do a nice job of driving a 1-kilowatt stage, if you want to go the limit.

### Mechanical and Electrical Features

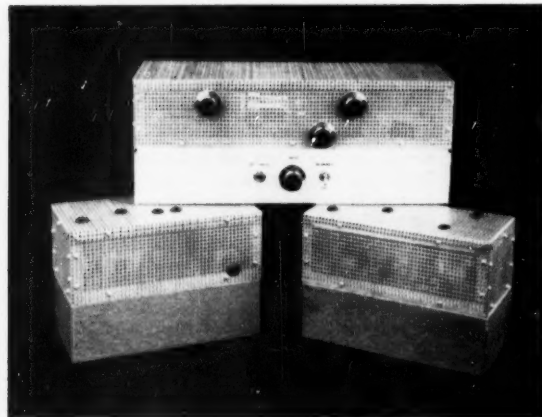
The two exciter-transmitters, described in this portion of the article, are as near alike electrically and mechanically as possible. The same tube types are used in both, one extra stage be-

• Interested in getting on 6 or 2 meters with a moderate investment? Would you like to be able to add power when time and finances permit? If so, these rigs should interest you. If you want to go on either band, or both, you can build the two low-powered rigs, one at a time as your preference dictates. Then when the pocketbook has recovered, you go on to the amplifier. It works on both bands at the 120-watt level. Low-cost tubes and simple circuitry throughout.

ing needed for the 144-Mc. job. The cases are identical and parts layouts are similar. The oscillator circuits and components are the same, and power supply connections are interchangeable. Provision is made for metering that will work with either unit.

Either r.f. section operates within the capabilities of a 300-volt 100-ma. power supply, so the rigs are well suited to mobile or civil defense applications. A power source delivering 300 volts at 150 ma. will take care of either transmitter and a suitable modulator.

The crystal oscillators use an overtone oscillator commonly called the Robert Dollar circuit. Its regenerative kick is obtained by connecting the crystal back to a capacitive network in the plate circuit. The value of the smaller of the two capacitors connected from the low side of the plate coil to ground controls the regeneration. The 50  $\mu$ f. shown is satisfactory for any crystal we've ever tried, and the oscillator may be used with 8- or 24-Mc. crystals interchangeably.



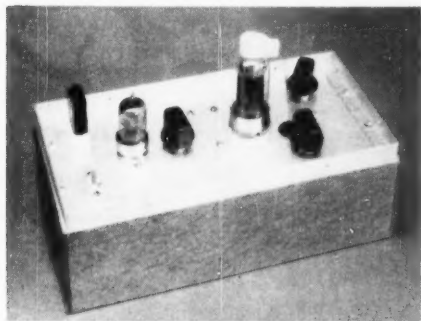
A 120-watt transmitter for 50 and 144 Mc. The two small units, each capable of 25 watts input, are described in this issue.

### OUR COVER

This month's cover shows an inside view of the 120-watt amplifier, to be described in a subsequent issue.

Crystals for 144-Mc. work should be between 8 and 8.222 Mc. or 24 and 24.666 Mc. For the 50-Mc. band they lie between 8.334 and 9 Mc. or 25 and 27 Mc. As the third overtone may not be an exact multiple of the fundamental frequency marked on the crystal holder, crystals that multiply out close to the band edges should be checked very carefully to be sure that the operating frequency is actually within the required band.

The first tube is a 12AT7, operating as an overtone oscillator in the first section, doubling to 50 Mc. or tripling to 72 Mc. in the second triode. Normal capacitive coupling is used between the oscillator and multiplier portions in both units. Capacitive coupling is used between the 50-Mc. doubler and the 2E26 amplifier in the 6-meter unit, but both the doubler plate and amplifier grid circuits are resonant. Tuning of these circuits,  $C_1$ - $L_2$  and  $L_3$ , which is resonated by the



Top view of the 50-Mc. rig, with cover removed.



Top rear view of the 144-Mc. exciter-transmitter, showing power and output connectors on back of the chassis.

input capacitance of the 2E26, is not critical. The method of coupling shown gives better energy transfer than either straight inductive or capacitive coupling. The two coils are mounted side by side (see bottom view) about a diameter apart, but their relative position is not critical.

The second tube in the 144-Mc. transmitter is a 12AT7 with its triodes connected in parallel, doubling from 72 to 144 Mc. Almost any small triode could have been used at this point, but the 12AT7 keeps the tube types required to a minimum. Coupling between the doubler and final stages is inductive, with both circuits being tuned with small plastic-sleeve trimmers. The doubler plate and final grid coils,  $L_3$  and  $L_4$  in Fig. 2, are mounted end to end, their spacing being adjusted for maximum energy transfer.

The final stages of the two rigs are necessarily quite dissimilar, as several unusual features are incorporated in the 144-Mc. stage to insure efficient operation at that frequency. The grid

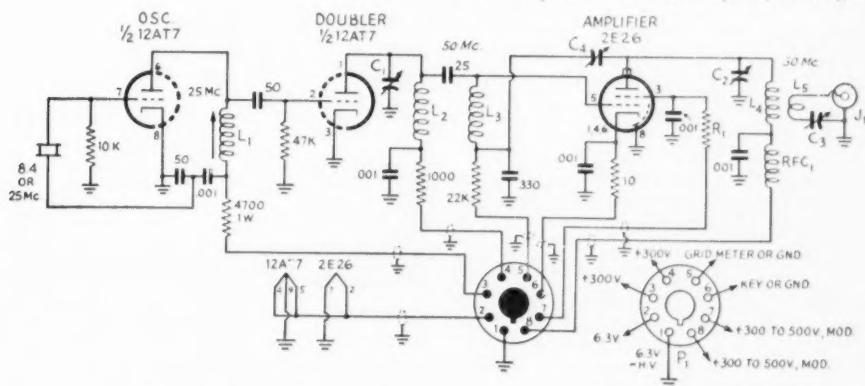


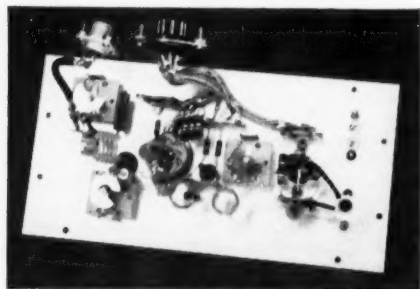
Fig. 1—Schematic diagram and parts information for the 50-Mc. transmitter.

- $C_1$ —15- $\mu$ mf, midget variable (Hammarlund HF-15).
- $C_2$ —15- $\mu$ mf, midget variable, double spaced (Hammarlund HF-15X).
- $C_3$ —50- $\mu$ mf, midget variable (Hammarlund HF-50).
- $C_4$ —1-8- $\mu$ mf, plastic trimmer (Eric 532-10).
- $R_1$ —33,000 ohms, 3 watts (3 100,000-ohm 1-watt resistors in parallel).
- $L_1$ —24 turns No. 30 enam. closewound on  $\frac{3}{8}$ -inch slug-tuned form (National XR-91).
- $L_2$ —53 $\frac{3}{4}$  turns No. 20,  $\frac{5}{8}$ -inch diam.,  $\frac{3}{8}$  inch long

- (B & W Miniductor No. 3907).
- $L_3$ —Same as  $L_2$ , but 6 $\frac{1}{4}$  turns.
- $L_4$ —5 turns No. 20,  $\frac{3}{4}$ -inch diam.,  $\frac{1}{2}$  inch long (B & W No. 3910).
- $L_5$ —6 turns No. 20,  $\frac{1}{2}$  inch diam.,  $\frac{3}{8}$  inch long (B & W No. 3903).
- $J_1$ —Coaxial output fitting (Amphenol 83-1R).
- $J_2$ —8-pin male power fitting (Amphenol 86-RCP8).
- $P_1$ —8-pin female cable connector (Amphenol 78-PE8).
- RFC<sub>1</sub>—Solenoid 50-Mc. r.f. choke (Ohmite Z-50).

circuit of the 50-Mc. amplifier is tuned by the tube's input capacitance only, but the 144-Mc. grid circuit is series tuned. Parallel tuning is used in the 50-Mc. plate circuit; series tuning on 144 Mc. Neutralization in the 50-Mc. stage uses the capacity bridge system, wherein the value of the grid-circuit by-pass is a critical factor. The 144-Mc. amplifier is neutralized by the insertion of a small inductance ( $L_5$ ) in the screen lead.

Output is taken off through coaxial fittings on both rigs. Coupling is adjustable by varying the position of the coupling coils, but once the optimum position is found the series-tuning



Bottom of the 50-Mc. r.f. section. Note that power and output connectors are wired to their respective cables, for mounting in the chassis.

capacitor can be used as a loading adjustment for minor variations. Either rig may be operated into a balanced line through a balun or an antenna coupler.

Power is connected to either unit through an 8-pin fitting on the rear wall of the chassis, and provision is made for metering or keying in the cable. The cathode lead of the 50-Mc. rig may be keyed, but it was found that opening of the 144-Mc. cathode tended to make the amplifier unstable, so it was grounded directly at the socket. As there is an extra stage in the 144-Mc. unit it was necessary to bring out the oscillator and tripler plate leads to a single pin on the power connector. Otherwise the cable connections are the same for both units, and the cable may be connected to either one without wiring changes.

### Construction

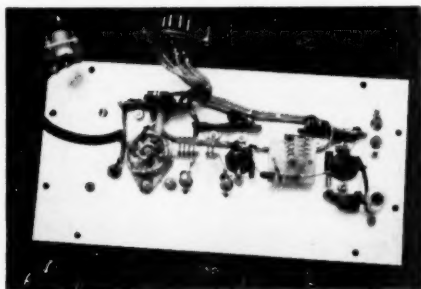
The transmitters are built on  $5 \times 10$ -inch sheets of aluminum that mount on aluminum chassis of the same size, 3 inches high. As may be seen from the bottom views, the power supply and output connectors are wired with sufficient lead length to permit slipping them into position when the cover plate is attached to the chassis. All parts except the crystal and tubes are mounted below the deck on the 50-Mc. rig, but the need for the shortest possible leads dictates that the 2E26 plate circuit be mounted near the tube cap in the 144-Mc. job. Note also that the 2E26 base shield is grounded externally by spring clips on each side of the tube socket.

Covers for the two rigs are made of perforated aluminum  $3\frac{1}{2}$  inches high. Where TVI or the need for mechanical protection, as in mobile service, are not factors this shielding can be omitted if desired. It adds to the neatness and safety of operation, however, and its use is recommended. As may be seen from the top views, the sides of the cover are fastened in place on mounting brackets of aluminum angle stock. This can be purchased ready made, or bent up from sheet aluminum stock. The four sides of the cover are held together with similar angle stock, and the cover can be fastened in the same way, or made with bent-over edges, as shown in the photographs.

The shaft-type variable condensers are equipped with knobs, for ease of tuning when the covers are removed. These knobs are sawed crosswise to a depth of about  $\frac{1}{16}$  inch to make a slot for screwdriver adjustment. These, and the slots in the other trimmer and coil screws, are reached through grommets in the cover.

Either rig could be built in a considerably smaller space, but the arrangement shown is still compact, and it is open enough to permit easy wiring and adjustment. The actual arrangement of parts is not particularly critical, except in the 144-Mc. r.f. circuits, where minimum lead length is imperative. Looking at the top view of the 6-meter rig, we see, left to right, the crystal, oscillator-doubler tube, doubler plate tuning adjustment, 2E26, final plate tuning (front) and antenna series condenser (rear). The adjustment in the lower left corner is the oscillator plate coil slug.

The 2-meter rig is shown the other way around, so that the power plug and coaxial fitting on the



The 2-meter rig is laid out in similar fashion, except that the final plate circuit is above the chassis.

rear wall may be seen. The crystal is at the far right. Next are the first 12AT7, the tripler plate tuning knob, and the 12AT7 doubler. Just in back of this tube may be seen the trimmer adjustment,  $C_2$  in Fig. 2. The grid trimmer for the 2E26,  $C_3$  in Fig. 2, is to the right and in back of the amplifier tube. The plate circuit is in the upper left corner, with its trimmer partially hidden. The trimmer in the foreground is the antenna series adjustment,  $C_4$ .

The 50-Mc. bottom view shows the oscillator-

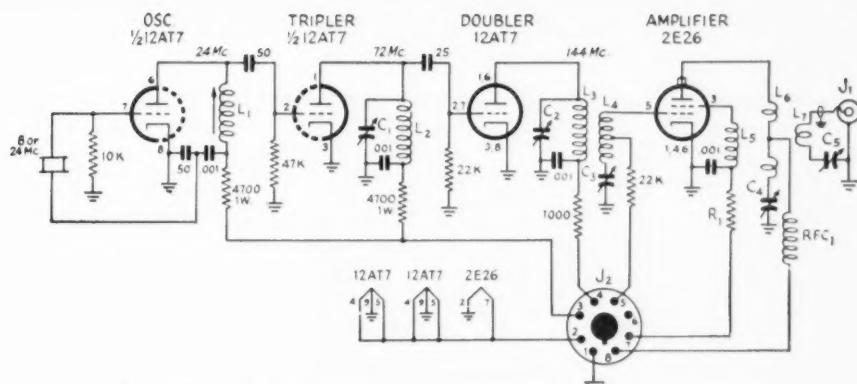


Fig 2—Schematic diagram and parts list for the 144-Mc. transmitter.

C<sub>1</sub>—15- $\mu$ af. variable (Hammarlund HF-15).  
 C<sub>2</sub>, C<sub>3</sub>—1-8- $\mu$ af. plastic trimmer (Erie 532-10).  
 C<sub>4</sub>—15- $\mu$ af. double-spaced variable (Hammarlund HF-15X).  
 C<sub>5</sub>—50- $\mu$ af. variable (Hammarlund HF-50).  
 R<sub>1</sub>—33,000 ohms, 3 watts (3 100K 1-watt in parallel).  
 L<sub>1</sub>—20 turns No. 28 enam. on  $\frac{3}{8}$ -inch slug-tuned form (National XR-91).  
 L<sub>2</sub>—4 turns No. 20 tinned,  $\frac{1}{2}$ -inch diam., spaced twice wire diam. (B & W No. 3002).  
 L<sub>3</sub>—2 turns No. 3002.

L<sub>4</sub>—4 turns No. 3002, center-tapped.  
 L<sub>5</sub>—27 turns No. 30 enam. on 1-watt resistor (Ohmite Z-235).  
 L<sub>6</sub>—4 turns No. 12 tinned, spaced  $\frac{1}{4}$  inch,  $\frac{3}{4}$ -inch diam., center-tapped.  
 L<sub>7</sub>—1 turn  $\frac{3}{4}$ -inch diam., made from inner conductor of RG59U coax connecting to J<sub>1</sub>.  
 RFC<sub>1</sub>—Ohmite Z-144.  
 J<sub>1</sub>—Coaxial output fitting, female (Amphenol 83-1R).  
 J<sub>2</sub>—8-pin power fitting, male (Amphenol 78-PF8).

doubler components at the right. The doubler plate and amplifier grid coils are near the middle of the assembly. The 2E26 plate coil is to the left of the tube socket, with its tuning condenser below. The smaller coil is for antenna coupling (L<sub>5</sub> in Fig. 1) with its series capacitor, C<sub>3</sub>, above. Arrangement of parts in the bottom view of the 144-Mc. unit is more obvious, the amplifier plate circuit being above the chassis. Note that the doubler plate and amplifier grid coils are end to end in this unit. Their polarity should be clear from the photograph. They are mounted on their respective trimmers.

Power wiring is done with shielded cable, in the interest of neatness and to make it easier to filter out harmonics. Little trouble will be experienced with TVI in most localities, with such low power level and complete shielding. If the power wiring does radiate troublesome harmonics, these can be eliminated by the usual additional shielding and filtering procedures.<sup>1</sup>

#### Testing the 50-Mc. Unit

The rigs should be tested stage by stage, beginning with the oscillator. This is made easy by the power cabling system used. A power supply delivering 6.3 volts a.c. or d.c. at 1.5 amps or more and 200 to 300 volts at 100 ma. should be used for testing. Start with Pins 1 and 2 connected in the power cable as shown in Fig. 1. To check the oscillator of the 50-Mc. rig, connect a 50- or 100-ma. meter in series with the power source and Pin 3, to measure the oscillator plate current.

<sup>1</sup> "TVI Hints for the V.H.F. Man," *QST*, April, 1953, page 16. Similar information in 31st edition of the ARRL Handbook.

Apply plate voltage (preferably 200 volts or less) and check for oscillation. There will be a kick in the plate current as oscillation starts. Couple a 2-volt 60-ma. pilot lamp with a 1-turn loop of wire to L<sub>1</sub> and adjust the slug for maximum brilliance. Check the note of the oscillator on 25 Mc., or some harmonic thereof, to be sure that it is crystal controlled. There should be only a slight change in frequency as the slug is tuned through resonance, or as the voltage is applied and removed. Placing the hands or a metal object near the coil should also have only a small effect, if any, on the frequency. The oscillator plate current should be about 10 ma. at 200 volts. If oscillation stops when the slug is set for maximum output, detune it slightly until the oscillator starts readily every time.

Now connect the supply directly to Pin 3 and run the metered lead to Pin 4. Connect a low-range milliammeter, preferably 0-10 ma or less, between Pin 5 and ground to measure the grid current developed in the 2E26 stage. Apply plate voltage to the doubler stage, through the meter and Pin 4, and tune C<sub>1</sub> for maximum indication in the grid meter. This should be about 3 ma. with 200 volts or so on the plates, and no plate voltage on the amplifier. Recheck the oscillator slug for maximum grid current at this time.

Resonance in the 2E26 grid circuit can be checked by inserting first a brass slug and then a powdered-iron slug into the grid coil, L<sub>3</sub>. Both should cause the grid current to drop. Should the brass slug cause the current to rise, L<sub>3</sub> is too large. If the iron slug raises the grid current, L<sub>3</sub> is too small. Its inductance is not particularly

(Continued on page 114)

# The "Simple Squirt" Beam

An End-Loaded 14-Mc. Two-Element Beam for Small Space

BY BILL CLASEN,\* W4GMY

• Here's another 20-meter beam with shortened elements. This time the elements are end-loaded. The facts that this design doesn't require insulating the elements from the boom, and that gamma or T matching systems can be used, are some of its advantages.

CONFIDENTIALLY, fellows, this all came about because my XYL, W4RIG, wouldn't approve my plans for installing a full-size 20-meter rotary array over the top of our small house.

The "Simple Squirt" is a miniaturized 20-meter beam, loaded at the ends rather than at the center.<sup>1</sup> End loading has certain features that made it preferable to me. For one thing, you can use "plumber's-delight" construction, and gamma match for coax feed. This not only simplifies construction, but also means that many 10- or 15-meter beams can be quite easily converted for 20-meter operation, provided the boom length is 12 feet or more. And, while I haven't made comparative measurements, and don't want to start any heated arguments, it seems to me that it is better to place the loading coils near the ends of the antenna where the current is low, rather than at the high-current point at the center.

\* 15 Dorset Drive, Virginia Hills, Alexandria, Va.

<sup>1</sup> Getter, "A Compact Two-Element Beam for Twenty"; Henneken & Pigg, "The VP (Vest-Pocket) Beam," *QST*, May, 1954.

## Driven Element

The driven element consists of a center section and a loaded insert on each end. The element is fed with RG-8/U, and matched with a tuned gamma. The center section is a 12-foot piece of  $1\frac{1}{2}$ -inch inside-diameter tubing. The two loaded inserts are each constructed of two pieces of  $1\frac{1}{2}$ -inch outside-diameter tubing 3 feet long, and a 12-inch piece of polystyrene rod 1 inch in diameter. The polystyrene rod is installed between two of the 3-foot sections of tubing. It is inserted a distance of 4 inches into each section of tubing and secured with two through bolts.

We now have a 6-ft. 4-in. insert consisting of two 3-ft. sections of tubing, and 4 inches of exposed polystyrene rod which will be the coil form. The writer used rubber-insulated wire which appears to be about the same size as No. 10 solid copper. Thirty turns were close-wound on the exposed polystyrene, and each end soldered to lugs fastened to through bolts. See Fig. 1. When both loaded inserts are completed, they are inserted, one in each end of the center section, to a distance of 30 inches.

We now have a 19-ft. 8-in. element which is ready to be checked with a g.d.o. for resonant frequency. See Fig. 2. A frequency of 14.2 Mc. was chosen as the desired center operating frequency. Tuning is accomplished by adjusting the length of the element just as in any normal parasitic array. If pruning of the coils is necessary, caution should be used to maintain the same number of turns on both coils.

The gamma match is constructed of No. 8 solid copper wire and the match point is 35

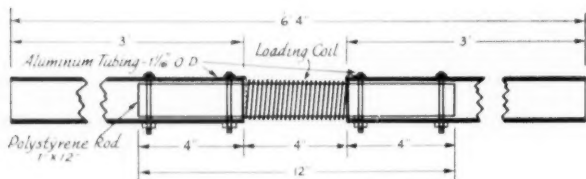


Fig. 1—Detail sketch of the loading insert assembly for each end of the two elements of the "Simple Squirt" antenna.

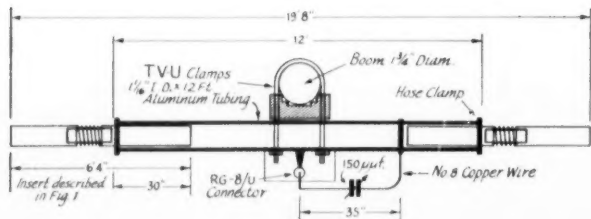
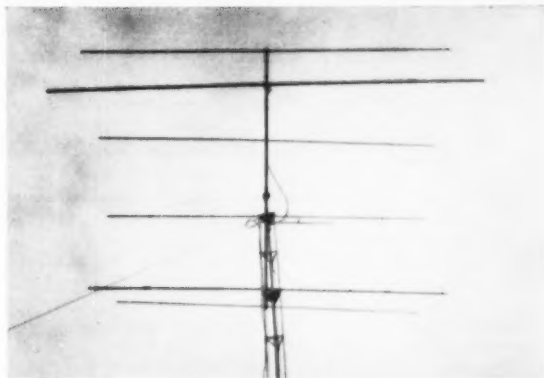


Fig. 2—This sketch shows how the elements of the "Simple Squirt" antenna are attached to the boom, and the manner in which the loading inserts are added.



A "bottom" view of the "Simple Squirt" 20-meter beam, showing a comparison between the lengths of the loaded 20-meter elements and standard 10-meter elements.



inches out from the center of the element. The variable condenser has a maximum capacitance of about 150  $\mu\text{f.}$ , and a plate spacing of 0.024 inch has been adequate for the 125 watts input used. The condenser is weather-protected by an inverted plastic cup.

#### Parasitic Element

It was decided to use a reflector in the 2-element array described. The construction is

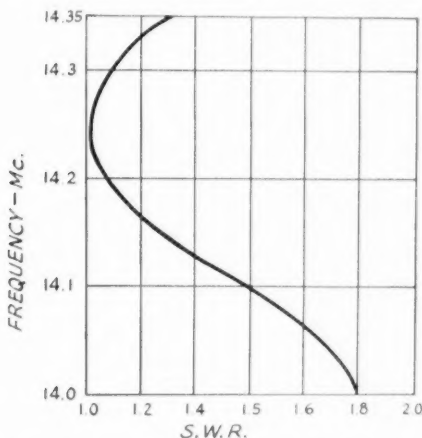


Fig. 3. — S.w.r. measurements of the "Simple Squirt" antenna over the 14-Mc. band. In this case, elements were adjusted to favor the 'phone portion of the band.

exactly like the driven element without the gamma match, and the loading coils have 32 turns each, instead of 30 turns. The reflector should be tuned about 700 kc. lower in frequency than the driven element. If a director were used, the number of turns on the loading coil

would be reduced, and the element tuned about 700 kc. higher than the driven element.

#### Boom and Supporting Structure

The writer had a 4-element 10-meter antenna erected and, as an expedient, the driven element and reflector were attached to the existing structure for a quick test. The boom is 14 feet long, and the spacing of the two 20-meter loaded elements is  $10\frac{1}{2}$  to 11 feet. See photographs. The rotator is a Radiart TR-2 TV-antenna rotator.

As the antenna mast is mounted on the roof, it is not convenient to make any adjustments of element length, once the structure is raised. The two elements were temporarily rigged at an intermediate height, and element-length adjustment was checked with a field-strength meter. No significant improvement was observed during this crude check, and the elements remained as originally adjusted. A pointer-type knob was attached to the gamma-match tuning condenser, and this can be adjusted from the roof with the aid of a long bamboo pole with a notch cut in the end. Standing-wave-ratio measurements on this antenna are made with a "Micro-Match," and are shown in Fig. 3.

The materials used were mostly those on hand, and are not especially recommended over smaller-diameter elements and other materials. Also, there may be better ways of installing the loading coils in the element inserts.

#### Suggested Three-Element Beam

Based on the experience gained operating the 2-element Simple Squirt for almost a year, the

(Continued on page 118)

W4GMY's end-loaded 20-meter beam is mounted on the same boom carrying his 10-meter 4-element job.

October 1954



# Some Principles of Radiotelephony

## Part IV†—Designing a Modulator

BY BYRON GOODMAN,\* WIDX

THERE are at least two simple ways one can go about obtaining a suitable modulator design for an existing or contemplated transmitter. The easier method of these two is to determine what the d.c. input to the modulated amplifier is (plate voltage times plate current in amperes = power input in watts) and then, knowing that the modulator must furnish audio power equal to one-half this power value,<sup>1</sup> find a suitable design in one of the radio publications. This will give the builder all of the information he needs except the turns ratio of the modulation transformer, a subject that will be discussed shortly. From a practical standpoint, it is advisable to allow for a little reserve power to take care of transformer losses and possible mismatch, so it is not unwise to select a 60- or 65-watt modulator for use with an r.f. amplifier input of 100 watts, instead of unsuccessfully trying to squeeze every last watt out of a modulator rated at 50 watts output.

Lacking a suitable design for the modulator, one must resort to some elementary design work, the major subject of this article.

### The Output Transformer

Assuming that a suitable modulator has been built, it must be coupled to the r.f. stage through a transformer with the correct, or nearly so, turns ratio. At least that's what the books and your friends will tell you, so let's digress a minute and see what it's all about.

A transformer in the audio range of frequencies consists of an iron core and a couple of coils of wire, as in Fig. 16. Call the number of turns in

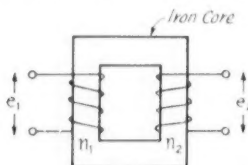


Fig. 16—A transformer for audio frequencies consists of two coils of wire wound around an iron core. The relationship between the voltages appearing across the windings is explained in the text.

one coil " $n_1$ ," and in the other " $n_2$ ." It is a basic property of a transformer that the volts-per-turn in one winding will be the same as the volts-per-turn in the other winding, since theoretically anywhere around the core a single turn of wire will enclose the same magnetic field. Thus if both

coils have the same number of turns, 10 volts a.c. applied to one winding will cause 10 volts a.c. to appear at the terminals of the other winding. If  $n_2$  is twice the value of  $n_1$  (Fig. 16), then  $e_2$  must be twice the value of  $e_1$ , and so on. A formula for the effect would be

$$\frac{e_1}{e_2} = \frac{n_1}{n_2}$$

and we would call  $n_1 \div n_2$  the "turns ratio."

Using a transformer with a turns ratio of 1.0, and connecting a source of 10 volts a.c. to one winding,  $n_1$ , what power do we take from the a.c. source? None at all, if the transformer is a perfect one, because as yet there is no resistance in the circuit and consequently nothing to dissipate the power. (Actually all transformers have losses, as will be discussed in more detail later, but we'll stick with a "perfect" transformer for a while.)

Now suppose we connect a 100-ohm resistor across  $n_2$ , as in Fig. 17A. From the paragraph above we know that 10 volts a.c. is appearing across  $n_2$ , and 10 volts across 100 ohms means a power of  $10^2 \div 100 = 1$  watt (power in watts =  $E^2 \div R$ ). The only place this power can come from is the 10-volt a.c. source connected to  $n_1$ —nothing else in the circuit can possibly deliver power. Consequently the current from the a.c. source, and thus the current through  $n_1$ , is  $1 \div 10 = 0.1$  ampere ( $I = W \div E$ ). For a turns ratio of 1.0, the current through one winding is equal to the current through the other. So far as the a.c. source is concerned, it might as well be connected directly to the 100-ohm resistor instead of to the transformer. The 10-volt source "sees" a 100-ohm load through the transformer.

But suppose the turns ratio is 2.0. For 10 volts a.c. applied to  $n_1$ , 5 volts a.c. will appear at  $n_2$  and across the 100-ohm resistor. This represents a current through the resistor of  $5 \div 100 = 0.05$  ampere. The power dissipated by the resistor is  $5^2 \div 100 = 0.25$  watt. Hence the power from the 10-volt source is 0.25 watt, and the current is  $0.25 \div 10 = 0.025$  ampere. The current varies inversely with the turns ratio, or

$$\frac{i_2}{i_1} = \frac{n_1}{n_2}$$

The a.c. source would deliver this same current and power if it were connected directly to a resistance of  $10 \div 0.025 = 400$  ohms ( $R = E \div I$ ). The a.c. source "sees" a load of 400 ohms through the transformer under these conditions. The load of 100 ohms across  $n_2$  is "transformed" to a load of 400 ohms at  $n_1$  when  $n_1 \div n_2 = 2.0$ . A general expression for the effect is

$$\frac{R_1}{R_2} = \left( \frac{n_1}{n_2} \right)^2, \text{ or } \frac{n_1}{n_2} = \sqrt{\frac{R_1}{R_2}}$$

\* Assistant Technical Editor, QST.

† Earlier parts of this article appeared in May, June and July QST.

<sup>1</sup> As explained in Part II of this article.

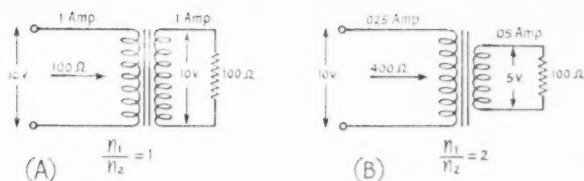


Fig. 17 — Illustrating how the transformer acts to “transform” a resistance load to a different value, depending upon the turns ratio of the transformer.

In words, it means that the ratio of resistance (“impedance”) transformation is as the square of the turns ratio. This is the property we will make use of in coupling the modulator to the r.f. amplifier.

The impedances given for a transformer are not what you see looking into it with no load across the secondary. In other words, the catalogs may show a transformer “10,000-ohm primary to 90,000-ohm secondary.” All this means is that the turns ratio is such that 90,000 ohms connected across the secondary will look like 10,000 ohms at the primary. The same transformer with 45,000 ohms across the secondary will “look” like 5000 ohms at the primary. The turns ratio is such that an impedance transformation of 1:9 is obtained — obviously the turns ratio is 1:3. It is a good idea to use transformers designed to be used in the impedance range desired, however—you wouldn’t use a 500- to 200-ohm transformer for a 5000- to 2000-ohm job.

It was mentioned earlier that no transformer is perfect. Obviously the windings have resistance, since these windings consist of many, many turns of wire. The  $I^2R$  losses introduced by the resistance of the windings are called the “copper losses.” There are also “iron losses,” which are a combination of eddy-current and hysteresis losses. The iron losses are practically constant for a given primary voltage, regardless of the current flowing through the windings. Optimum design occurs when copper and iron losses are equal under usual conditions. A close analysis of transformer operation involves drawing an “equivalent diagram” of a transformer and showing these losses as resistances, as in Fig. 18. Here  $n_1$  and  $n_2$  represent the “perfect” transformer, with a turns ratio  $n_1 \div n_2$ . The actual windings have resistance that can be measured with an ohmmeter—these resistances are represented by  $r_1$  and  $r_2$ . Their effects in the circuit are obvious: current flowing through them will cause voltage drops that lower the applied voltage and the output voltage. The iron losses are represented by  $r_m$ , and they depend upon the applied voltage and the design of the transformer.

The coils of the transformer have inductance, of course, and the inductance of the primary winding is represented by  $L_m$ . It is this inductance that limits the flow of current through the transformer when the primary winding of the transformer is connected to an a.c. source and the other winding is left open-circuited.

If the  $n_2$  secondary circuit in Fig. 18 were shorted at its output, the load on the transformer would be  $r_2$  and, if the ratio  $n_1/n_2$  were 1.0, you would expect a load of  $r_2$  in series with  $r_1$  to appear at the left-hand terminals. Such is not the case, however; when the experiment is performed it will be found that a low resistance of this order does not appear.

Instead, the load appears to be higher and it shows an inductive component. This is explained by the “leakage reactance” of a transformer, represented by the inductances  $L_1$  and  $L_2$ . It is a result of incomplete linking of the magnetic lines of flux through the coils—it does not contribute to the inductance of the transformer or the transfer of energy from one coil to the other.

There are such things as capacity between windings and the distributed capacities of the individual windings that could have been included in the equivalent diagram, but they are insignificant at voice frequencies and would only tend to complicate the picture. The important thing to remember is the significance of “turns ratio,” “leakage reactance,” “primary inductance” and “winding resistance.”

You can see now why it was mentioned earlier that you want to use transformers in the same general “impedance” range specified for them. A “good” transformer should have a high primary inductance,  $L_m$ , but as the turns are increased to boost the inductance, the wire resistance,  $r_1$ , increases also. The transformer is designed, therefore, for a general impedance ( $E \div I$ ) level, which works out to be a design where copper losses equal iron losses at or near the full rating of the transformer. If the transformer is used at a considerably higher impedance level ( $E$  increased for the same  $I$ ), the  $L_m$  that did a perfectly good job of holding the open-circuit current down to a reasonable value will now be incapable of doing so. Another way of saying this, and one that you perhaps know instinctively from substituting power transformers, is that they can be used at lower voltages than rated but not at voltages greatly in excess.

The primary inductance is also an important factor in the frequency response of the transformer. If the primary inductance of an audio transformer is too low, the low-frequency response will suffer because the losses of the trans-

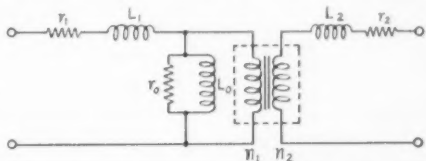


Fig. 18 — An “equivalent” circuit of a transformer, showing the effects and relationship of coil resistance and inductance.

former increase as the frequency is decreased, as anyone has found out who has tried to operate a 400-cycle power transformer on 60 cycles. The 60-cycle transformer is satisfactory at 400 cycles, however.

### Selecting the Output Transformer

Getting back to the modulator, let's assume that a suitable one has been built and that we are now interested in what transformer to use between the plates of the modulator tubes and the r.f. stage we are to modulate. To determine what the turns ratio should be, you have to know two things. First calculate the *load resistance* presented by the r.f. stage. This is simply the plate voltage divided by the plate current (in amperes) that is supplied to the r.f. stage. For example, if the r.f. stage is one that operates at 600 volts and 150 ma. (0.15 ampere), the load resistance is equal to  $600 \div 0.15 = 4000$  ohms. (The input power is  $600 \times 0.15 = 90$  watts, so you know the modulator should deliver 45 watts ( $90 \div 2$ ) and preferably 55 or 60 watts.) Incidentally, these values of voltage and current should be the actual values and not the "book" values. In other words, measure the plate voltage and current applied to the transmitter—don't just assume that you are getting 600 volts from a plate supply because you hoped you would when you built the supply.

The next step is to determine what load resistance the modulator tubes should work into. It may have been given in the article describing the design you followed. The ARRL *Handbook* gives the value for one particular set of operating conditions—plate voltage, grid bias—and if the plate voltage is the same or close to the value you use, the *Handbook* is a good reference. If you are using some other value of plate voltage on the modulator tubes, you can refer to a tube manual or tube bulletin on the particular type of tube you are using. (These manuals and bulletins are available from the tube manufacturers.) If the plate voltage you have for the modulators is something in between the typical values given by the manufacturer in his publications, the easiest approach is to take an "educated guess." In other words, if the tube bulletin shows a plate-to-plate load resistance of 6200 ohms at 400 volts and 8000 ohms at 500 volts, and your supply delivers 475 volts, call the plate-to-plate load resistance about 7500 ohms.  $\infty$

You now know the power the output transformer must handle (the power delivered by the modulator) and the load resistances to be matched (7500 and 4000 ohms, in the examples given). You can be very scientific if you like, and use the simple formula

$$\text{Turns ratio} = \sqrt{R_1/R_2}$$

which, for the example, would be equal to  $\sqrt{7500 \div 4000} = \sqrt{1.875} = 1.37$ , primary to secondary. But it won't do you much good after you have worked it out, because practically all transformer data sheets give "primary" and "secondary" impedance values instead of turns

ratio. You can work out the turns ratio for various connections from the data, if you need practice in taking square roots. But to be practical about the whole thing, you're interested in finding the set of connections that come closest to the resistance (impedance) values you are using. Look at the values given for primary impedances—they might be 3000, 5000 and 8000 ohms, for example. In the secondary column, you might also find 3000, 5000 and 8000 ohms. Working out the impedance ratios available with the transformer (and neglecting step-up ratios because they don't apply in this example), you would have a list like this:

Impedances	Impedance Ratio
8000-8000	1.00
8000-5000	1.60
8000-3000	2.67
5000-5000	1.00
5000-3000	1.67
3000-3000	1.00

Now comes the moment of decision. At first glance, that 8000-5000 combination looks closest to what you want for your 7500-4000 match, but in comparing the impedance ratios you see that the 5000-3000 combination actually comes a little closer. Which one should you use?

This is where a little knowledge can be a helpful, instead of a dangerous, thing. In the first place, you will recall that you are attempting to "match impedances" because that is the condition under which the modulator will deliver the full power. In other words, if the modulator doesn't work into its proper load, it won't deliver as much power as it will when correctly loaded. In the second place, if the transformer doesn't have enough turns and therefore not enough primary inductance, the efficiency will be poor at low audio frequencies. For any given transformer, you will always have to compromise between good over-all efficiency and good low-frequency response. In amateur work, the low audio frequencies are not very important, and it is usually better to sacrifice low-frequency response than to sacrifice efficiency, unless you have a modulator that is much larger than necessary.

Having reviewed the reasons behind a selection of windings, the actual choice becomes simple. We will use the 5000-3000 combination, although at first glance it may seem wrong for the job, since both values are below our actual values. We can expect to lose a little at the low-frequency end of the audio range, but it will take measurements to show it—it is hardly likely to show up on straight listening tests.

It will occur to many readers that a closer match could be obtained by changing the power to the r.f. amplifier. For example, a ratio of 7500/4500 is the same as a ratio of 5000/3000, so if we reduced the antenna coupling at the r.f. stage until we were drawing only 134 ma. ( $600 \div 4500 = 0.134 = 134$  ma.), we would have an exact match. Under these conditions, the d.c. input to the modulated stage would be  $0.134 \times 600 = 80$  watts, instead of the original 90 watts we were figuring on, and we would probably

have an excess of available modulator power.

It's not really worth it. Actually, the modulator tubes will see a higher load than you have calculated, because the leakage reactance and wire resistance add to the reflected load, and it is advisable to make the load resistance slightly lower than its calculated value. If you make it too low, however, the efficiency will decrease and the power output may go down.

### The Driver Stage

So far the design and adjustment of the modulator have been fairly straightforward. We didn't mention the class of operation of the modulator tubes because it didn't matter—the previous remarks apply to anything from Class A to Class B. However, the class of operation is quite important when considering the driver stage.

In Class AB<sub>1</sub> operation, the modulator tubes are never driven hard enough to draw grid current, and the driver stage has only to provide sufficient voltage to swing the modulator grids. Any small tube capable of delivering the necessary voltage can be used. If the necessary voltage swing is too high or if a high value of grid leak cannot be used with the particular type of modulator tubes, transformer coupling can be used. A talking point for Class AB<sub>1</sub> operation is the ease and economy of driver design, but Class AB<sub>1</sub> operation does not normally take full advantage of the tube capabilities. A notable exception is the 6146—a pair of them are rated at 120 watts output in Class AB<sub>1</sub> and 130 watts in AB<sub>2</sub>.

Another advantage of Class AB<sub>1</sub> operation is that the bias supply is simple. All that is required is a source of negative voltage at very low current, and a potentiometer can be used to permit exact adjustment of the bias voltage. This is permissible because no grid current passes through the potentiometer—if such a bias supply were used in Class AB<sub>2</sub> or Class B operation, the grid current would generate additional bias through the resistance of the potentiometer.

That last sentence might stand a little explanation, since it seems to be a point that confuses people occasionally. To illustrate, let's consider the grid circuit of our modulator stage, as shown in Fig. 19. Only one tube is shown, for simplicity. A source of bias,  $E_c$ , has a voltage divider across it—it is shown as two resistances,  $R_1$  and  $R_2$ , for clarity, but it could of course be the usual potentiometer. The source of bias might be a battery, a VR-tube regulated supply, or any other source of voltage that does not change with the current through it. Let's say it delivers 100 volts. Then we can see that the voltage appearing between grid and cathode of the tube is

$$\frac{R_2}{R_1 + R_2} \times E_c$$

If we want 50 volts of bias on the tube,  $R_1$  and  $R_2$  could be 5000, 50,000 or 500,000 ohms (or any other values), provided they are both the same. Let's say we are using a pair of 50,000-ohm resistors. The bias voltage between grid and cath-

ode will be 50 volts. A current of 1 ma. flows through  $R_1$  and  $R_2$  from  $E_c$ . If and when the grid is driven positive with respect to cathode, grid current flows around the circuit: cathode to grid through transformer through  $R_2$  and back to cathode. This current adds to the 1 ma. through  $R_2$  and increases the voltage across  $R_2$ . If the grid current is small compared with 1 ma. the increase won't be much, of course. However, it is obvious that the grid current flowing through  $R_2$  will change the bias and thus the operating point of the tube during the time grid current flows. The effect can be minimized by using lower values of resistance at  $R_1$  and  $R_2$ , but this puts a greater current demand upon the voltage source  $E_c$ . And while we have only mentioned the effect of grid current through  $R_2$ , it should be apparent that if the resistance of the secondary of the transformer is high, the d.c. voltage drop across it can raise the bias.

When the grid current is encountered in a modulator, as it must in Class AB<sub>2</sub> or Class B operation, the bias supply must be "stiff," which means that the voltage across it does not change appreciably with the current flowing through it. Dry batteries can be used for the purpose, although if high values of grid current are run the

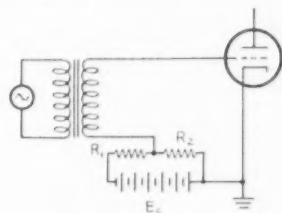


Fig. 19—When bias for a vacuum tube is derived from a voltage divider, grid current in the tube will change the bias, as described in the text.

life of the batteries will not be very long. Where heavy grid currents are encountered, electronically-stabilized bias supplies are generally used.

In Class AB<sub>2</sub> or Class B operation, when the modulator tubes are driven into grid current, the driver stage must furnish the power represented by this current dissipated in the effective grid resistance. Since the effective grid resistance is usually different than the proper plate load resistance for the driver-stage tube (or tubes), a matching transformer is required.

There are methods for calculating the turns ratio for the transformer, but they are considerably beyond the scope of any article such as this. However, that doesn't mean you can't go ahead and build the modulator. To the contrary—sensing your possible difficulty, the tube and transformer manufacturers are more than co-operative in furnishing the necessary information. The tube handbooks usually include operating information and transformer turns ratios for the tubes most suitable for Class-AB<sub>2</sub> and Class-B service, so there is no need to resort to a formula. Suitable driver tube types are suggested, and



their operating conditions are given. You will find that tubes requiring little or no grid bias — the so-called "zero bias" tubes — will be recommended for this work. The 811A is popular for modulators in the 300- to 400-watt range.

The driver transformer, coupling the driver stage to the modulator grids, will have a "step-down" ratio that is dependent upon the type of driver tube, the type of modulator tube, and the operating conditions of both. The turns ratio may range all the way from 1.25:1 to 6:1. It will be given as the ratio of "primary to one-half secondary," which may be a little confusing at first. However, it comes about because only one of the modulator tubes is drawing grid current at any instant. This is illustrated in Fig. 20.

The other consideration in choosing the driver transformer is its power-handling capability. Obviously you wouldn't use a 2-watt transformer with a 15-watt driver, if you wanted it to run cool, and you wouldn't use a 30-watt transformer with a 5-watt driver unless you already had the transformer, its turns ratio was right, and you could afford the extra space.

All this is just by way of pointing out that the catalogs and tube manuals are your best sources of information on driver transformers, and no amateur need fear that he will select the wrong transformer for the job, if he reads the catalogs carefully.

### The Speech Amplifier

Suppose you now have a design up to a pair of, e.g., 6A3s in the driver stage. The tube manual says to run them Class A (no grid current), with a bias of -62 volts. You know that the maximum grid swing you will need will be 124 volts peak-to-peak ( $62 + 62 = 124$ ). The *Handbook* has a table of resistance-coupled voltage-amplifier data for the common tubes, from which you can select a pair of tubes that, operated in push-pull, will give the necessary grid swing to the 6A3s. Transformer coupling can also be used of course. A little judicious study of the *Handbook* on the subject of speech amplifiers will allow you to select a tube line-up that will result in sufficient gain from microphone to the 6A3 grids.

### General Considerations

The drivers and modulators mentioned above were both triodes, but there may be instances where tetrodes would be the choice for modulator tubes. In such a case, the above considerations for matching to the load and the driver considerations still hold. The screen voltage for the tetrodes should be supplied from a "stiff" power source (one whose voltage doesn't vary radically with changes in load), because the screen current may vary from a no-signal value of around 0 up to a maximum-signal value of 15 to 60 ma. In some cases, the screen voltage can

be taken from the speech-amplifier plate supply, if the required voltages are the same.

And one last word. *Never* attempt to test a modulator without a load on the secondary of the transformer. You stand a good chance of breaking down the transformer. You can use a resistance load in place of the (operating) r.f.

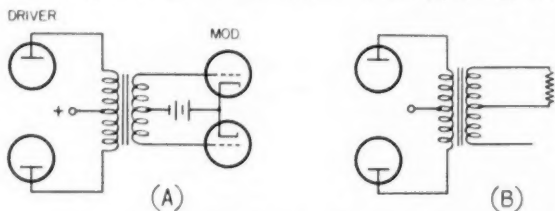


Fig. 20 — When a driver stage drives a Class AB<sub>2</sub> or Class B modulator into grid current, only one of the modulator tubes is drawing grid current at any instant. Consequently the driver load appears across only one-half the secondary winding, as shown at B.

stage to be modulated, but you should have a load of some kind, unless you have more transformers than you know what to do with.

## 21st ARRL Sweepstakes — Nov. 13th-14th and 20th-21st

How many ARRL sections and how many stations in those sections can you work in two week ends? If you are located anywhere in the League's field-organization territory (see page 6), you are cordially invited to take part in this popular annual operating activity. Any amateur bands, 'phone or c.w., may be used. The total operating time allowed each contestant is 40 hours. 'Phone entries are compared only with other 'phone entries — c.w. scores only with other c.w. scores — in your particular section, in the competition for awards. The week-end periods starting Saturday afternoon (1500 PST or 1800 EST) on the 13th and 20th of November mark the open season for SS contacts.

A complete announcement of the contest, including the rules governing participation, will appear in November *QST*. The rules will be the same as those of the 1953 SS. Amateurs in remote ARRL sections who do not receive the November issue before the Sweepstakes may refer to November, 1953, *QST* for contest details.

Contest reporting forms will be sent to all amateurs who request them by mail or radiogram. It is not necessary to make advance entry or to use these forms, if the report form prescribed in November 1953 or in the next issue of *QST* is followed.

# An Improved Volume-Compression Circuit

## Diode-Impedance Control in an "Electronic Funnel"

BY W. D. BROSSEAU,\* W5BSU

• The circuit described in this article controls the over-all gain of a speech pre-amplifier by varying the actual signal input to the controlled stage rather than, as in more common arrangements, by varying the gain of the controlled stage. The circuit has a wide compression range and good operating characteristics.

THE effectiveness of a 'phone transmitter can be greatly increased by taking advantage of volume compression and eliminating the low frequencies in speech. Most of the intelligibility in speech is in the range of 500 to 2500 cycles, but the power is concentrated in the range below 500 c.p.s. It is these low frequencies that modulate a telephone transmitter the heaviest, and if they can be attenuated the frequencies that carry most of the intelligibility can be boosted without overmodulating the transmitter.

By using volume compression we impart more gain to low-intensity signals than to those of high intensity. Since an intensity range of 20 to 30 db, will normally be produced by an individual talker, a volume compressor will reduce this range of signal intensities to more useful levels.

A volume compressor is a nonlinear device with loss at any time dependent upon the intensity of the input. Practical compressors are designed to have a slight time delay between the time a signal reaches the input and the time the gain is changed. The average loss is controlled by syllabic variations rather than by individual speech peaks, and is held relatively constant over syllabic intervals.

With speech, constant output levels are difficult to maintain unless some form of a.g.c. is used that follows the average (not peak) variations in normal speech. This is usually done by rectifying and filtering some of the audio output and applying the rectified and filtered signal to some portion of the amplifier to control its gain, the over-all gain of the system being great enough for full output at a low voice input level. A.g.c. systems used in receivers usually change the amplification of a Class A stage by varying its grid bias in some manner. Applied to audio amplifiers, this system as a whole tends to overload easily and distorts, unless several stages are controlled at once.

The system of volume compression to be described overcomes these objections by varying the impedance from grid to ground of a single tube, and acts as a manual volume control would if it were electronically operated. The heart of the system is the property of a diode of showing decreasing impedance with an increase of current through

it. A duo-diode is used in a balanced bridge circuit to control the grid impedance of a single stage much in the same manner as a manual volume control would.

Fig. 1 shows a simple circuit using a diode to control the grid-to-cathode impedance of a single stage of an amplifier. A portion of the output is fed through a transformer to a half-wave rectifier and pulsating d.c. is developed across  $R_1$ . This is filtered by  $R_2C_1$  and  $R_3C_2$ , and current is caused to flow in the duo-diode circuit. Since diodes have

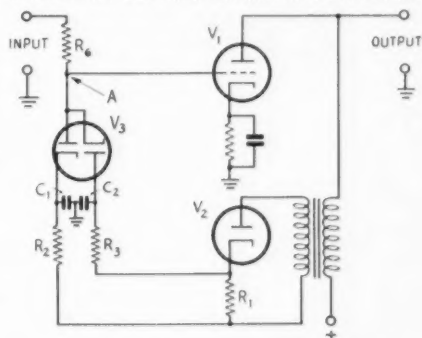


Fig. 1—The basic compressor circuit. Output from  $V_1$  is rectified by  $V_2$  and the direct current from  $V_2$  is used to control the impedance of  $V_1$ . The impedance of  $V_1$  in series with  $R_6$  forms a voltage divider having an input/output voltage ratio dependent upon the impedance of  $V_1$ .

a characteristic of decreasing impedance with increasing current flow, this lowers the impedance to ground of point A through the balanced circuit of the duo-diode and  $C_1$  and  $C_2$ . Any increase in the input signal strength to the stage will cause a decrease in signal applied to  $V_1$ , with the result that the output of  $V_1$  tends to remain constant.

### Time Constants

In this simple circuit no provision is made to control the point at which the a.g.c. begins to operate. Also, no provision is made for independent compression and release time constants. With a steady signal into the amplifier, a state of equilibrium is quickly reached, but over short intervals of time this condition is upset since it takes an appreciable length of time for the a.g.c. system to act after a change in input signal strength.

This length of time is governed by the compression and release time constants of the a.g.c. system, the sensitivity of the a.g.c. system and the amplitude of the input signal. Low-intensity signals only slightly above the level required to

\* c/o Sooner Electronics Co., Tulsa, Okla.



The photos taken off the face of a Tektronic scope with a Polaroid Land camera show the ability of the control circuit to handle large changes in input intensities with negligible distortion and still keep the output level within 2.5 db. throughout its entire dynamic range.

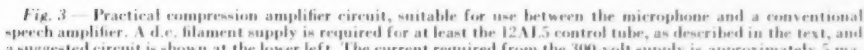
The rectified signal amplitude which will cause current to flow in the duo-diode is determined by the value of negative voltage from batteries  $B_1$  and  $B_2$  applied to the control tube,  $V_3$ . The level of input signal at which a.g.c. will begin to decrease the gain of the amplifier is determined in part by the amount of this negative voltage. If the current through the diode cuts off when a voltage of  $-3.5$  volts is applied to it then any lesser voltage — e.g.,  $-2.5$  volts — would cause the diode to draw current, thus reducing the gain of the amplifier even before any signal was applied to its input.

back signal would have to be 1.5 volts, the difference between  $-3.5$  and  $-5$  volts, before the delayed a.g.c. action would start.

Normally, the a.g.c. system is operated with a voltage greater than the cut-off value. A decrease in voltage will decrease the average controlled level. An increase in delay bias voltage will increase the average level of the controlled amplitude, since a given signal amplitude will cause less current to flow into the control tube, thus controlling  $V_1$  at a higher operating level. A decrease in the gain of  $V_1$  or the a.g.c. amplifier will also increase the average level of the controlled signal since a given input signal amplitude will cause less current to flow into the control tube. Increasing the gain preceding  $V_1$  will cause the a.g.c. system to operate with a smaller signal at the amplifier input and the average output signal level (a.g.c. controlled) will not change. The over-all sensitivity of the amplifier will be increased, however.

Fig. 3 is a diagram of a practical volume compressor designed to be placed between a crystal or dynamic microphone and the microphone input terminals of a speech amplifier. Three stages of voltage amplification are used to pro-

(Continued on page 118)



Capacitance values are in  $\mu\text{f}$ . for 0.001  $\mu\text{f}$ . and larger;  $\mu\text{mfd.}$  for smaller values. Condensers less than 0.01 should be mica or ceramic. Resistors are  $\frac{1}{2}$  watt unless otherwise indicated.

C<sub>1</sub>, C<sub>2</sub> — 2-μf. paper, 5 per cent tolerance, 100 volts (Fansteel).

**L<sub>1</sub>** — Approx. 20 henrys (Stancor C-1515).

 $I_2 = 0.05$  henry, 0.6 amp.

CR — Selenium bridge rectifier (Federal No. 1017)

S<sub>1</sub> — D. v. d. t.

T<sub>1</sub>—Secondary voltage 18 r.m.s., 0.6 amp.

## Re the "Tubeless VFO"

THERE have been a number of reports of frequency modulation with "tubeless VFOs" patterned after the one described in the June issue,<sup>1</sup> and since we had looked particularly for f.m. in the original tests without finding it, further investigation seemed indicated. The results reported in June *QST* were of the "over the air" variety and did not permit ready observation of the effects of various adjustments (or misadjustments) of the exciter. Accordingly, a more thorough look was taken at the situation under laboratory conditions, using a Central Electronics 10B exciter.

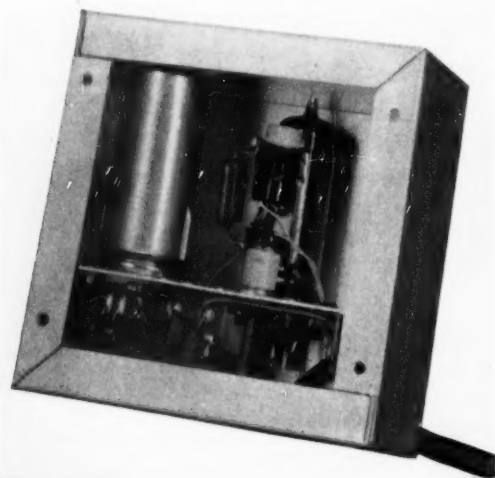
For one thing, it appears that some of the customers have indulged in rather unthinking construction and operation. The original model of the circuit was built as an experiment and reported as such in *QST*, it being taken for granted that anyone trying the same system would observe the precautions that are customary with any VFO. W1MBK reports a couple of cases where the ground return was made clear across the panel from the crystal socket, with the inevitable result that r.f. from the final stage was picked up on the ground lead and introduced into the oscillator circuit. Feedback of this sort has been a bugaboo of VFO operation for as long as VFOs have been used, so poor performance under such conditions is not surprising. Moving the ground return to a point just as close as possible to the crystal socket, and keeping the lead just as short as possible, cleared things up nicely in these cases.

Aside from such constructional errors, it is possible to get undesirable f.m. if the exciter is improperly operated. The oscillator frequency is

not completely independent of the signal level at the No. 3 grid of the 6BA7 mixer. The frequency shift appears to follow the average rather than the instantaneous signal level; in other words, the frequency does not shift at an audio but at a syllabic rate. Using a two-tone test signal at an operating frequency of 4 Mc., increasing the a.f. input from zero to the level that gave maximum undistorted output from the exciter showed a detectable frequency shift with the unit described in June *QST* and the particular 10B on which the test was made. (Incidentally, the 4-Mc. frequency is the worst case, since it is closest to the oscillator frequency. With 14-Mc. output the frequency shift is noticeably smaller.) However, with voice input driving the exciter to full output on peaks, the average frequency shift was so small, because of the lower average level, that it was not observable. Repeated tests switching back and forth between the VFO and crystal confirmed that the signal sounded the same, and could be tuned in just as readily, with either frequency source.

However, this was true *only* so long as the exciter was operated within its capabilities. The frequency shift became observable when the signal began to "flatten," and the transition point was so definite that it is probably characteristic of other exciters than the one used here. In short, overdriving and f.m. go hand in hand. Actually, it is a trio and not a duo — noticeable distortion joins the party at this point, too. With crystal control the distortion is equally apparent, but the f.m. is not.

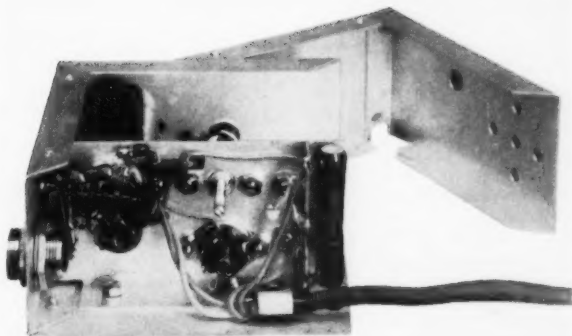
A word to the wise should be enough, but like much that goes on in single sideband, you can't really be sure of your signal amplitude unless you monitor it on a 'scope. In a properly designed



Interior construction of the oscillator unit. The small shelf is the full width and depth of the box, thus making full use of the available space. The coil-form slug is adjusted through a hole in the bottom side.



Practically all the components are grouped around the oscillator tube socket. With one L-shaped side piece removed as shown, all wiring is readily accessible.



set-up, the linear amplifier that follows the exciter should flatten before the exciter's overload point is reached, so normally there should be a pretty fair margin of safety for f.m. If the exciter overloads before the linear, you need to start over again, anyway.

Voice-control operation can give trouble. If the voice-control circuit cuts in at too high an audio level the exciter will overload momentarily even though the speech intensity is kept within proper bounds after the transmitter is on. The result is a "yoop" at the start of each transmission. The setting of the voice-control adjuster is critical; it must operate at an audio level far enough below the overload point to prevent the "yoop," and in the particular model of 10B used in these tests this required a fairly high order of sensitivity and a resulting fairly long hold-in time. It is probable that some users have got into difficulties because of setting the voice-control level for snappier action. However, this momentary overloading is undesirable regardless of the method of frequency control, since it is in the flattening region and therefore the cause of spurious emissions.

Another possible cause of frequency shift is poor line-voltage regulation when a high-power amplifier is used. A few volts drop when the amplifier loads the line at a syllabic rate is tolerable, but when the change is of the order of 5 to 10 volts the frequency shift becomes noticeable. This can be helped by using a VR-105 to regulate the voltage applied to the oscillator anode of the 6BA7. This and some other changes made in the exciter in the course of checking (for example, a frequency shift of a few cycles that occurred when switching from "manual" to "voice control," and an irregular shift of similar nature that took place from one transmission to the next on voice control, were cured by additional r.f. filtering in the relay-contact circuits) are not discussed in detail here because, in one sense, they defeat one of the primary purposes of the "tubeless" VFO unit since they require digging into the exciter.

To sum up, the unit as originally described is capable of entirely satisfactory performance

when constructed and used as intended. It will not, however, take abuse in the form of excesses that lead to distortion and spurious radiation regardless of the method of frequency control. And above all, neither this nor any VFO should be put on the air without at least a preliminary monitoring. Listening to the oscillator, with the receiver b.f.o. on, in the 5-Mc. range to determine whether it shifts frequency under modulation is such an obvious step that it should hardly be necessary to mention it.

In the case of the 10B exciter, the "calibrate level" control makes a separate oscillator tube desirable. This control operates on the No. 3 grid of the 6BA7 and has far more influence on the oscillator frequency than any of the effects discussed above. If it is set at a relatively low level when zeroing on another station, the actual transmitting frequency may be quite a bit different from what was anticipated. To make full use of this feature, it becomes necessary to use a separate oscillator, and a suitable one is described below. Such an oscillator also is recommended if you lack confidence in your ability to keep the signal level within proper bounds at all times.

#### An Oscillator Unit

The low-drift feature of the remote-tuned VFO is worth retaining whatever the tube arrangement, so the tuned circuit described in June *QST* is a good basic tuning unit for the 5- and 9-Mc. combination. The oscillator unit shown in the photographs is a variant of the Mix idea<sup>2</sup> but using a triode oscillator loosely coupled to a tuned pentode buffer amplifier, the two tubes being conveniently supplied in one bulb by a 6U8. The circuit diagram is given in Fig. 1. No changes were made in the tuning unit beyond substituting a shielded three-conductor connector for the 300-ohm line plug used originally. This takes care of the grounding problem. The necessary voltages are picked up from the socket provided for that purpose at the rear of the exciter. An OB2 voltage regulator tube is included for maintaining the oscillator plate voltage and buffer screen voltage constant.

Except for the fact that in recent years it has become customary to use an e.c.o. version of the

<sup>2</sup> Mix, "Simple Remote Tuning for the VFO," *QST*, January, 1953.

series-tuned oscillator while Fig. 1 shows a grounded-cathode triode, the circuit is quite straightforward. The separate amplifier was used in the thought that it would give better isolation than an e.c.o. plate circuit, particularly when a tuned output circuit is used. The only unusual component value is the  $5\text{-}\mu\text{f.}$  condenser,  $C_2$ , used to couple the oscillator plate to the buffer grid. This was made just large enough to drive the buffer to the required output. A slug-tuned tank,  $L_1C_1$ , is used in the buffer plate circuit, and is coupled by a small coil,  $L_2$ , to the No. 1 grid of the 6BA7 through the socket connection on the exciter. The number of turns on  $L_2$  was adjusted to deliver maximum voltage to the 6BA7 No. 1 grid through a short (7-inch) length of ordinary 5-conductor cable. A different cable length might require a different number of turns; in this case just enough length was used to permit mounting the unit on the back of the exciter cabinet.

The circuit of Fig. 1 is built on a small shelf inside a  $2 \times 4 \times 4$  aluminum box. The shelf is mounted on one of the removable sides, and all the wiring except the connections to  $J_1$  is done on just these two pieces before the rest of the box is attached. The box portion is sawed through at diagonal corners as shown, and  $J_1$  is mounted on one of the L-shaped pieces. To insure a good ground connection between  $J_1$  and the oscillator circuit an oversize soldering lug is made from a piece of sheet copper, with a hole large enough to fit under the mounting nut and a shank long enough to reach the oscillator ground point on the small "deck."

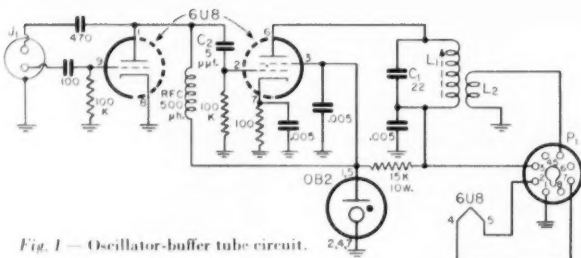


Fig. 1 — Oscillator-buffer tube circuit.

Capacitance values below 0.001  $\mu\text{f.}$  are in  $\mu\text{mf.}$ , 0.001 and above in  $\mu\text{f.}$  All condensers ceramic except as indicated below. Resistors are  $\frac{1}{2}$  watt composition except as indicated.

C<sub>4</sub> = 22- $\mu$ f, silver mica (20 or 25  $\mu$ f, also satisfactory).

L<sub>4</sub>—Adjustable to app. 30  $\mu$ h.; 1-inch winding of No. 30 enam. on  $\frac{3}{8}$ -inch

slug-tuned form (National XR-93)

$L_2 = 9$  turns No. 24 d.c.c. wound over ground end of  $L_1$ .

1<sub>1</sub>—3-conductor microphone connector (Amphenol 80-PC2F; mating plug for cable is 80-MC2M).

P<sub>1</sub> = 3-prong cable connector, male (Amphenol 86-PM8).

RFC = 500-ohm choke (Mullen 34300-500).

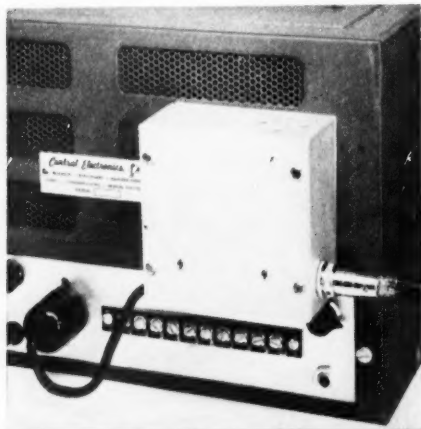
The second L-shaped piece has a small cutout in one corner to allow the cable to pass through, and is attached after the wiring is done and the unit has been tested. The second cover plate, when attached, makes the final assembly practically as rigid as the original box. This plate is used as a template for drilling the back of the exciter cabinet, where the whole unit is held by self-tapping screws put in from inside the cabinet.

Note that the 6U8 is fitted with a shield. This was found to be of considerable benefit in reducing the effect on the oscillator frequency of adjusting the slug in  $L_1$ . Because the tube gets rather hot and the space in the box is limited, a good deal of heat is transmitted to the other components unless some means of ventilation is provided. Some holes drilled in the top and bottom edges of the box, over and under the 6U8, help keep things cooler and thereby make a worthwhile contribution to minimizing frequency drift.

To cover the necessary frequency range—350 kc. when the s.s.b. generator frequency is 9.0 Mc.—without adjustment a broadly tuning low- $C$  circuit would be desirable at  $L_1C_1$ . However, a 1-inch winding is about all that can be used on the coil form if the slug is to have much tuning effect, so it is necessary to use some  $C$  in the buffer tank. With  $L_1C_1$  set at the center of the range the output, as measured by the rectified voltage at the No. 1 grid of the 6B47 (using a v.t. voltmeter), drops off to about one-half at the ends of the range. The constants were chosen so that the rectified voltage at the center of the range was of the same order (20 to 25 volts) as that developed by the crystal oscillator in the exciter. The voltage is not critical, since the normal exciter output power can be obtained with identical waveform with as little as 5 or 6 volts.

With this arrangement the oscillator frequency is practically impervious to line-voltage changes

(Continued on page 129)



Showing the oscillator-buffer unit mounted on the back of the exciter cabinet.

# A Protective Circuit for Transmitting Tetrodes

*Novel Dual-Triode Device Provides Variable Input Control As Well*

BY THOMAS E. BELING,\* W9AEI/2

**G**RID-LEAK biasing of transmitter r.f. amplifiers has the advantage of being self-adjusting, economical and simple. Its big drawback, of course, is that excitation failure removes the bias from the amplifier and may result in very high plate current and consequent damaging of the tube. The most common solution is to apply fixed bias from an external source to limit the plate dissipation to a safe value, and then obtain the rest of the operating bias from a grid leak. This requires a bias supply of some sort, an appendage many amateurs like to avoid using.

In recent years most amateur transmitter designs have used beam tetrodes in their output stages. These tubes have the characteristic that their plate current, for a given grid bias, is practically independent of the plate voltage, being instead a function of the voltage applied to the screen. Advantage is taken of this fact in the familiar clamp-tube circuit, illustrated in Fig. 1.

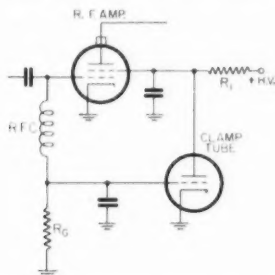


Fig. 1—Conventional clamp-tube circuit.

During normal operation the clamp tube is cut off by the bias developed across the amplifier grid leak,  $R_1$ , so it has no effect on the operation of the amplifier. Should the excitation fail, however, the clamp-tube bias drops to zero and it conducts heavily. This results in a large voltage drop across  $R_1$ , and consequently greatly reduced screen voltage. The plate current is reduced to a safe value thereby.

This arrangement works well with many tetrodes, and is widely used, but it will not do the job with the 6146. This tube requires a lower screen voltage than the clamp-tube circuit will provide, in order to hold the plate current to a safe value. A common way of doing this is to insert a VR tube in series with the clamp-tube plate and amplifier screen. The tube, ignited in normal operation, goes out when the applied

voltage drops, thus cutting off all voltage to the screen.

In designing a protective circuit for a new 6146 amplifier, the writer decided to try some form of series tube circuit in order to achieve a reasonably low screen voltage in case of excitation failure. The circuit shown in Fig. 2 does this, and

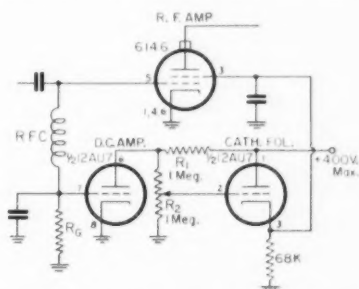


Fig. 2—Dual-triode protective circuit for 6146 or other beam tetrodes. The potentiometer  $R_6$  also controls the screen voltage under normal operation, and thus may be used for controlling the power input to the stage.  $R_1$  and the 68K resistor are  $\frac{1}{2}$  watt.

in addition provides a convenient control of the screen voltage and plate input as well. The latter is helpful for tuning-up purposes, and is very useful as an excitation control, if the 6146 is used to drive a higher-powered amplifier.

One half of a 12AU7 is used as a cathode follower (right side of Fig. 2), the other a d.c. amplifier. Operation of the circuit is very simple. When the 6146 is operating normally the d.c. amplifier (left triode) is cut off by the bias developed across the 6146 grid leak. The voltage applied to the cathode follower is determined by the voltage divider,  $R_1$  and  $R_2$ . Its cathode follows the voltage on its grid, so adjustment of  $R_2$  allows proper screen voltage, about 150 volts, to be applied to the amplifier. Should the drive to the 6146 fail, the bias on the d.c. amplifier will drop to zero. It will then conduct, and the drop across  $R_1$  will reduce its plate voltage to a low value. This low voltage will then be applied to the 6146 screen through the cathode follower.

Using the circuit values shown it is possible to reduce the screen voltage to approximately 20 when the drive is lost. This will keep the plate current of the 6146 low enough so that the plate dissipation of the tube will not be excessive. This circuit has several advantages over the more

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(Continued on page 122)

# Two-Dial Receivers and 100-Kc. Signals

## Pointers on Using Frequency Standards

THE little 50 100-ke. frequency standard of W2JN, described in the July issue of *QST*, brought to mind that perhaps not everyone appreciates the usefulness of such a device or knows how to use it. This was forcefully brought home recently while watching several different operators "setting" various ham bands on a new two-dial receiver they were torturing. A 100-ke. oscillator was included in the receiver, but only the "savvy" operators used it or knew how to — the others ignored it.

### The 100-Kc. Frequency Standard

A number of the current receivers either incorporate a "Calibrator" or "Crystal Calibrator" or else make provision for one as an additional feature. The "Calibrator" is a crystal-controlled 100-ke. oscillator, designed to be rich in harmonics. Such 100-ke. oscillators can also be built<sup>1</sup> and used with any receiver. One is a mighty handy little device to have around the shack, because it will enable you to sneak up close to the edge of a band with your transmitter, if you have the courage of your convictions about your ability to use the gadget. Let's see what it does and how to use it.

If the 100-ke. standard gave no harmonic output, its output would be plotted against frequency as is shown in Fig. 1A. There would be a signal from the oscillator at 100 ke., and no energy from it at any other part of the radio spectrum.

But Fig. 1A was just a theoretical idea, because almost any practical oscillator that you might build would have a lot of harmonics. This can be represented by Fig. 1B, which shows signals every 100 ke. Those near 100 ke. will be louder than those at higher frequencies, and thus the 35th harmonic (at 3500 ke.) will be weaker than the 2nd harmonic at 200 ke. We will assume that the oscillator we're using has harmonics we can hear up to 30 Mc. — some oscillators would have and some wouldn't.

So far, you should have a mental picture of a 100-ke. oscillator that, when it is turned on, generates signals at every multiple of 100 ke. Fig. 1B is such a picture. Now ask yourself what happens if the 100-ke. oscillator is not on 100 ke. but is oscillating

at 100.1 ke. Instead of signals appearing at 200.0, 300.0, 400.0 and 500.0 ke. (and also 3500.0, 3600.0, etc., ke.), the signals now show at 200.2, 300.3, 400.4 and 500.5 ke. (and at 3505.3, 3603.6, etc., ke.). The error in cycles increases by the order (number) of the harmonic, so a 0.1-ke. error in our oscillator at 100 ke. gives an error at the 35th harmonic of 3.5 ke. This is the second mental picture to retain: A small error in the oscillator can give a large error at a high harmonic.

We don't have to run screaming into the night at this apparent disadvantage of a 100-ke. frequency standard — let's turn around and make it work for us. It's easy. Stop and think about how you are going to check the standard. WWV? Right. (We have to assume that WWV's signal is correct, and they do have a pretty good record.) If you use the WWV signal at 5000 ke., you will be comparing that standard against the 50th harmonic of your oscillator. And let's say that a 50-cycle beat note is the lowest you can ever hear out of your receiver, because of limitations in its audio system and your hearing. (Actually, you might do a little better than this, but it makes the arithmetic easier.) If you adjust your 100-ke. crystal standard to the point where you can no longer hear a beat note between its harmonic and the unmodulated signal from WWV, you know that your standard is within 50 cycles of being right at 5000 ke., which makes it within 1 cycle of being right at 100 ke. That's pretty good precision for a simple little gadget.

You may have noticed that an unmodulated signal from WWV was suggested. Most of the time WWV sends a standard tone and some time ticks, and every five minutes there is identification and some voice, but there is a short period

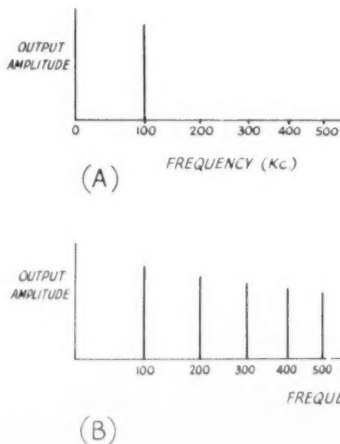


Fig. 1 — (A) A pure (no harmonics) 100-ke. oscillator would give output only at 100 ke.

(B) The actual output from a 100-ke. oscillator is rich in harmonics, and it furnishes "marker" signals every 100 ke. down through the spectrum.

<sup>1</sup> Examples other than the W2JN oscillator in the July issue include the one in Chapter 21 of *The Radio Amateur's Handbook*. An excellent article on frequency standards is Collier, "What Price Precision?", *QST*, Sept. and Oct., 1952.

following the announcement when there is no modulation, and that's the time it's easiest to check your standard. The receiver will be set up for 'phone (b.f.o. off) and tuned to WWV. When your 100-ke. oscillator is also running, there will be an audible beat between its 50th harmonic and WWV (if you're tuning in WWV at 5 Mc.) if the oscillator is not within 1 cycle of 100,000 ke. Swing the adjustment trimmer on the frequency standard through the zero-beat condition and leave it halfway between the settings where you just start to hear a low tone.

Some day you may want to learn the more precise methods for setting your frequency standard, as can be done with the b.f.o. on or with an oscilloscope, but the method just outlined is quite good for all but the most precise measurements.

When you first acquire a 100-ke. standard, you will probably want to check it every day or so, to see if it is stable and relatively insensitive to temperature changes. After familiarizing yourself with its particular habits, you can check it once a week or once a month, or whenever you are going to sneak quite close to the edge of a band. You now know how to check it, you know how well you can depend upon it, so you can work close to the edge if you have confidence. But don't get caught outside! The FCC won't listen to your claims that WWV must have drifted a little.

#### Setting Up a Receiver

It should be rather obvious now how you could check the frequency calibration of a receiver. All you do is turn on the 100-ke. oscillator and tune across the band being checked. If the signals from the standard appear at the 100-ke. intervals marked on the receiver dial, the receiver calibration is right. If they don't coincide, the receiver is wrong. In some cases you can do something about it, and in some you can't.

If, for example, you are using a single-dial continuous-coverage receiver like the BC-348, all you can do is to observe how much (if any) the calibration differs from the exact frequencies indicated by the 100-ke. oscillator harmonics. For future reference, you can make notes on these differences within an amateur band or, if you know your receiver, readjust the receiver oscillator trimmer to set the calibrations "on the nose." In some cases, you will find that if you reset the receiver-oscillator trimmer so that the dial reads right at 4.0 Mc., for example, it will be off at 3.5 Mc. In a case like this, the only cure is to bend plates on the tuning condenser. While this can be done, we recommend it only to brave souls who know what they're doing and understand receivers pretty well.

#### The Two-Dial Receiver

A more common case one may run into is that of the two-dial receiver, where one dial is called "bandset" and the other is called "bandspread." This is a flexible type of receiver that, when used

<sup>2</sup> It could also be on 3300 ke., but most receivers put the oscillator on the high-frequency side in this range.

with a 100-ke. frequency standard, can always be set up to give you one amateur-band edge very accurately. Let's spend a little time with it.

First off, you must realize that it is the "high-frequency oscillator" tuning of the receiver that determines the frequency to which the receiver is tuned. Fig. 2A shows in simple form the input circuits of a typical receiver. A 500-ke. i.f. amplifier is assumed (to make the arithmetic easier). When the receiver is set to receive a signal at

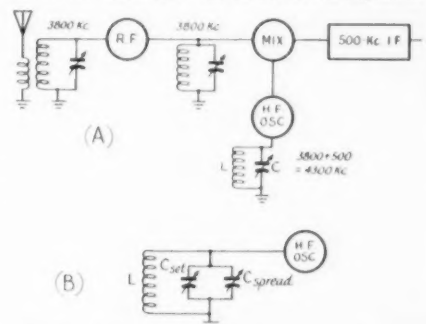


Fig. 2 — A block diagram of a receiver tuned to 3800 ke. is shown at (A). If it is a two-dial receiver, the oscillator tuning (and also the r.f. and mixer tuning) is done with two condensers in parallel, as shown in (B).

3800 ke., the r.f. and mixer circuits should be tuned to 3800 ke. If they are off slightly, the signal will not be amplified as much, but that's the only effect. (You've noticed this when you have twisted the "Antenna Trimmer" of a receiver — it changes the volume of the signal but doesn't detune it.) But the oscillator must be on 4300 ke.<sup>2</sup> to heterodyne the 3800-ke. signal to 500 ke. — any error here would heterodyne some frequency other than 3800 ke. to the 500-ke. i.f. To clarify, let's say the oscillator is on 4305 ke. The signal at 3800 ke. will be heterodyned to 505 ke., while a signal at 3795 ke. will be heterodyned to 500 ke. Hence it is the intermediate frequency and the high-frequency oscillator frequency in combination that determines the signal we will be tuned to. Since the i.f. is tuned at the factory and left fixed at one frequency, it is the high-frequency oscillator tuning that is all important.

In a two-dial receiver, the high-frequency oscillator condenser is actually two condensers in parallel. In other words,  $C$  in Fig. 2A would show up on the schematic of a receiver as two variable condensers in parallel, as in Fig. 2B. Now suppose that with the inductance  $L$ , we require 100  $\mu\text{f.}$  of  $C$  to tune to 4300 ke. When we have the two condensers in parallel, it is obvious that they can be set in a number of different ways to give a total of 100  $\mu\text{f.}$  For example, if  $C_{\text{set}}$  were set at 80  $\mu\text{f.}$ , we would be tuned to 4300 ke. with  $C_{\text{spread}}$  at 20  $\mu\text{f.}$  Or we could use an 81 + 19, 82 + 18, 83 + 17 or 78 + 22 combination.

Now think of a scale calibrated in ke. attached to  $C_{\text{spread}}$ . For convenience, this scale is going to

(Continued on page 124)



## • Technical Topics —

### A Circuit Symbol for the Junction-Type Transistor

TWO TYPES of transistors now are available to amateurs commercially, junction and point-contact. The junction form may be contrasted with the point-contact variety as follows:

1) the junction transistor was discovered and developed later;

2) it was designed theoretically before an experimental model was made; and

3) it more nearly conforms to a vacuum-tube triode in characteristics.

Lately the junction type has gained popularity because it lends itself readily to low-frequency circuit applications.

The electrical symbol of the semiconductor diode, Fig. 1A, dates back to galena-crystal days, before vacuum tubes. The present symbol for the transistor, Fig. 1B, is similar to that of the diode. It was first used for *point-contact* transistors. Later, when junction transistors were developed, the use of the established symbol for the point-contact transistor was made to serve both types.

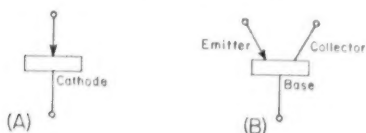


Fig. 1 — The schematic symbol for the point-contact diode (A) was modified when a symbol for the point-contact transistor (B) was sought.

Because of this it has become impossible to distinguish schematically which type of transistor is depicted in a diagram, except by a knowledge of the arbitrary numerical designations given them or in some cases by the associated circuitry. Junction and point-contact transistors have different characteristics and therefore many circuits designed for one type will not operate if the other is used. This can be compared in some respects to the differences in operation between a vacuum and gas-filled tube. The problem of distinguishing the vacuum from the gas tube on schematics was solved as shown in Fig. 2. An equally effective method of differentiating the junction and point-contact transistors seems justified. There are still

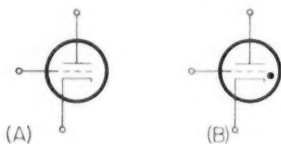


Fig. 2 — By convention it is an easy matter to distinguish the vacuum triode (A) from the gas-filled triode (B). At the present time there is no equally effective means for differentiating between the point-contact and junction-type transistor.

other good arguments to warrant a separate symbol for each of the two main types of transistors. The junction type is directly comparable to a vacuum triode; the point-contact is not. If the junction transistor is depicted as shown in Fig. 3, its elements correspond directly to their counterparts in a vacuum triode. As is shown in Fig. 3A,

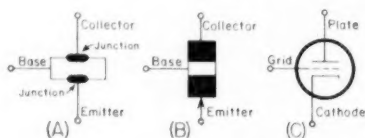


Fig. 3 — The actual physical structure of the junction-type transistor (A) could be used as its symbol (B). This representation will place the elements of the transistor in an order that permits a direct comparison with those of a vacuum tube (C).

the junction type is fabricated from a piece of germanium sandwiched between two alloyed junctions of another element, such as indium or antimony. Therefore, the suggested symbol is also related to the physical structure of the junction transistor.

Every vacuum-tube triode has a cathode that serves as a source of electrons. These electrons are attracted to the plate when its voltage is positive with respect to the cathode. The rate of electron flow along this path can be controlled by small voltages applied to the grid; a negative voltage reduces the flow while a positive voltage will increase it. Except in the special case of a Barkhausen oscillator, all triode tubes are operated with the voltage polarities as just described. This is not true for the point-contact or junction transistor. The polarity of the voltages applied to a transistor will depend on whether it is of the *n-p-n* or *p-n-p* type. These designations refer to the type of electrical conduction in each element of the transistor—in the emitter, base, and collector, respectively. The "*n*" stands for electron (negative) conduction and the "*p*" for "hole" (positive) conduction. An "*n*" type material contains an excess number of electrons. A "hole" is simply the absence of some electrons in the normal molecular bond structure of a semiconductor. The type of conduction in each part of the transistor is controlled during the manufacture of the device.

When the conventional transistor symbol, Fig. 1B, is used, the *n-p-n* and *p-n-p* types are differentiated schematically by the direction of the emitter arrow. An arrow directed toward the base indicates a *p-n-p* type while an arrow directed away from the base implies an *n-p-n* transistor. For the new symbol for junction transistors we

(Continued on page 128)

# Bandspreading the Clapp VFO

BY O. J. RUSSELL,\* G3BHI

THE Clapp oscillator, or some variant of the Clapp-Gouriet circuit, currently is just about top favorite for VFO use by hams. Fig. 1A is representative, and the values shown are typical for the 80-meter band. Because of the small tuning capacitance involved, the circuit does not lend itself readily to application of the conventional type of vernier control. The latter usually

limit the QSY on 14 Mc. to about plus or minus 6 kc.

Fig. 1B also includes a bandspread scheme that may appeal to many. The tuning element consists of a 150- $\mu$ mf. variable,  $C_2$ , in series with a fixed capacity of 50  $\mu$ mf. ( $C_3$ ). The tuning characteristic is shown in Fig. 2(A). The straight line B shows linear tuning for comparison. With linear

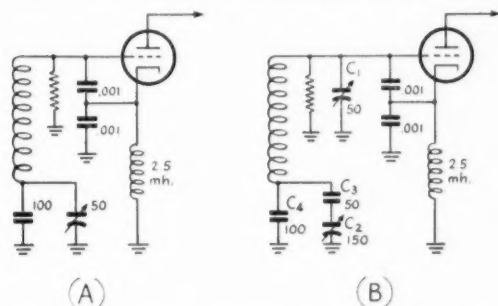


Fig. 1—A—Clapp VFO with typical tuning values. B— $C_3$  is a vernier covering only a few kc. on 80, useful in setting VFO accurately to zero beat.  $C_2$  and  $C_3$ , along with the usual fixed parallel condenser,  $C_1$ , produces a tuning curve that favors the higher-frequency bands.

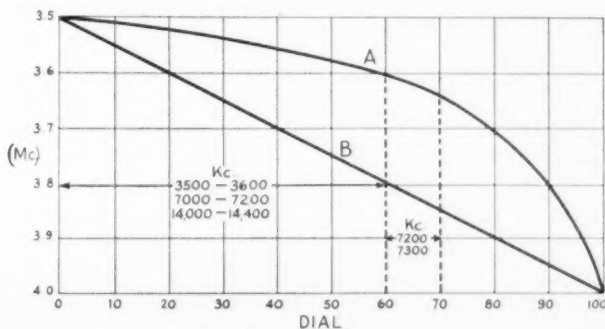
consists of a variable condenser of several  $\mu$ mf. in parallel with the main tuning condenser. However, in the Clapp circuit, a vernier of this type, covering only a few kc. for easy setting to zero beat, becomes impractically small. With the values shown in Fig. 1, a change of 5  $\mu$ mf. will cause a change in frequency of about 50 kc.

Accordingly there is need for another solution. The answer is suggested by one of the important virtues of the Clapp oscillator—its relative immunity to slight capacity changes associated with the tube. A 50- $\mu$ mf. variable, connected as shown at  $C_1$ , Fig. 1B, gives a well-nigh perfect vernier—a total QSY of about 6 kc. The tuning is almost precisely linear if a straight-line-capacity vernier (semicircular plates) is used. The h.f. c.w. man may prefer to use a 25- $\mu$ mf. variable to

tuning, the tuning rate on 80 is about 5 kc. per dial division. When multiplied for the higher-frequency bands, this means a tuning rate of 10 kc. per dial division on 40, and 20 kc. on 20 meters. With series tuning the characteristic is essentially linear out to about 3600 kc., with tuning rates of about 1.65 kc., 3.3 kc., and 6.6 kc. respectively on 80, 40 and 20. From 3600 to 3650 the rate is 5 kc. per dial division on 80, or 10 kc. per division over the range of 7200 to 7300. The latter is just about the same as the linear scale. Over the remainder of the range up to 4000 kc., useful exclusively for 80 meters, the average rate is about 12 kc. per dial division. For the ham who works several bands with the same VFO, the advantages of this tuning system are obvious. Combining this bandspread circuit with the vernier provides a tuning system that is easy to adjust to meet any requirement.

\* 15 Reepham Rd., Norwich, Norfolk, England.

Fig. 2—A—Typical tuning curve for the bandspread circuit of Fig. 1B. B—Linear tuning.



## • Recent Equipment —

### The TR-1TV Transmitter

**T**HE complete transmitter assembly under this Eldico type number consists of three rack-type units — r.f. section, modulator, and power supply — with a rack cabinet, forming a 300-watt input c.w. and a.m. 'phone rig. Each of the units is available separately, both in kit form and wired. The r.f. section is shown in the accompanying photographs.

A block diagram of the r.f. layout is shown in Fig. 1. Three 6CL6s are used in an 80- to 10-meter exciter for driving a 4E27A/5-125B final amplifier. The first 6CL6 can be used either as a crystal oscillator or as an amplifier following a VFO; in addition, provision has been made for using it as the oscillator for a "tubeless" VFO or external tuned circuit, fixed condensers for the series-tuned Colpitts circuit having been built in for this purpose. The oscillator has five output circuits, selectable by a switch for each band. On 3.5 Mc. the output is choke-coupled to the following stage; for all higher bands a slug-tuned coil is used to resonate with the tube capacitances to form a broadly-tuning tank. The oscillator grid-circuit frequency is 3.5 Mc. in all cases, and the tube is used straight through for final output on

control is not strictly necessary except on 10 meters. However, in our tests on the unit it was found that the 4E27A output reached a definite maximum with a grid current of 6 ma., dropping off with either more or less grid current, so the control can be quite usefully employed on all bands, since the drive will not normally stay constant over an entire band with fixed tuning.

#### Final Amplifier

The final amplifier, which is capacity-coupled to the 6CL6 driver, has a pi-network output tank using a tapped coil for adjustment of inductance to the value required for each band. This circuit is designed for working into 50- to 75-ohm resistive loads.

The output capacitance of the network consists of a 360- $\mu$ fd. variable condenser (a dual 180- $\mu$ fd. unit with the two sections in parallel) and two 400- $\mu$ fd. fixed mica condensers of the rectangular-cased r.f. type. By paralleling either one or two of these with the variable, the output capacitance is adjustable, substantially continuously, from a low value up to nearly 1200  $\mu$ fd. As shown in the photograph, the tank coil has its turns spaced out

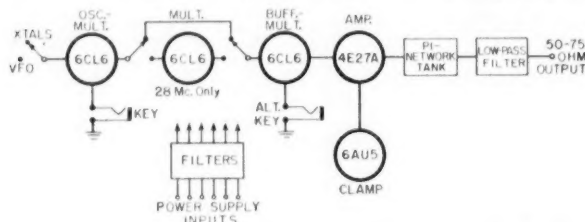


Fig. 1 — Block diagram of the TR-1TV r.f. section.

3.5 and 7 Mc., and as a frequency doubler for 14 through 28 Mc. Sockets for eight crystals, switch selected, are included.

The second 6CL6 shown in the block diagram is used only when the transmitter is on 27-28 Mc. It doubles from 7 to 14 Mc., and has its plate circuit fixed-tuned at 14.4 Mc. for driving the last 6CL6 as a 28-Mc. doubler. On all other bands the oscillator drives the last 6CL6 directly.

The third 6CL6, the driver for the 4E27A, also has five selectable coils, four of them slug-tuned, available for its output circuits. On 3.5, 7 and 14 Mc. this tube is used as a straight-through amplifier. On 21 Mc. it triples from the 7-Mc. output of the oscillator, and on 28 Mc. it doubles from the 14-Mc. output of the second 6CL6. A small variable condenser is connected across the output circuit for panel control of excitation to the 4E27A. For bands below 27-28 Mc. this may be set near minimum capacitance and the coil slugs adjusted to give optimum output throughout the band, inasmuch as "peaking" with this

at one end to reduce coupling to the part that is shorted on the higher-frequency bands.

The amplifier is neutralized by the capacity-bridge method, using a metal strip mounted on a stand-off insulator alongside the tube to form a neutralizing "condenser" with the tube plate. A regular Eldico low-pass filter is built into the unit as part of the output circuit.

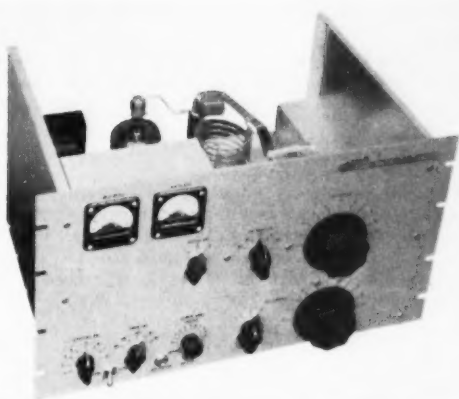
A 6AU5-GT, triode connected, is used as a clamp tube to protect the final amplifier from damage in case of loss of excitation or when keying a preceding stage. No fixed bias is required for the 4E27A, therefore.

#### Circuit Details

Two keying jacks are provided, one in the oscillator cathode and one in the 6CL6 driver cathode circuit. These are filtered for r.f., but no shaping circuits are included.

There are two milliammeters in the r.f. section. A 0-300 ma. unit is permanently connected in the final amplifier cathode circuit. The second meter

The TR-ITV r.f. section with the shield cover removed. It uses a 4E27A final amplifier tube and is rated at 300 watts input, 'phone and c.w.



is used for measuring grid current in the multiplier and final stages. Its range is 0-5 ma. for the multiplier and driver, and 0-10 ma. for the final.

A filament transformer is incorporated in the r.f. unit but all other voltages must be supplied from an external source. Leads to the connection terminals for 115 volts and for the d.c. plate voltages are all filtered for TVI, these filters being installed in a separate shielded compartment in the set. Terminals are provided for a 1500-volt supply for the final plate, 750 volts for the final screen (this is obtained through a dropping resistor from the plate supply), 340 volts for the oscillator and 400 volts for the other two 6CL6s.

The shielding methods in the set might give some ideas to the home constructor, since standard boxes and chassis no doubt could be employed in comparable arrangements. The exciter, final tube, and filament transformer are mounted on one chassis with a bottom plate. "Pan" type construction is used for the amplifier plate circuit, and the low-pass filter and lead filters are separately shielded in boxes mounted inside the pan

as shown in the photographs. A similar box arrangement is used to shield the meters.

#### Modulator and Power Supply

The companion modulator unit uses a pair of 811s as Class B modulators, with an output transformer having a separate winding for modulating the screen of the 4E27A. A 12AT7 is used as a cascade triode speech amplifier, working into a 6AQ5 driver for the modulators. Negative feedback from the 6AQ5 plate to the cathode of the second 12AT7 section improves the driver regulation. A filament transformer also is incorporated.

The power supply section is a dual unit having a 1500-volt supply capable of handling the r.f. final and modulators, and a 400-volt supply for the low-power stages in both the r.f. and audio sections. The former uses 866 rectifiers and has a two-section choke-input filter. The latter uses an adjustable resistor between negative and ground to supply 9 volts bias for the modulators, and also has a tapped voltage divider to furnish the 340 volts mentioned above. — G. G.

The exciter and final tube occupy the chassis section at the right in this view. The pi-network tank circuit has a tapped coil for hands-switching. Power terminals on the rear chassis wall are filtered for TV harmonics, with the filters shielded by the enclosure just inside the chassis. The low-pass filter is in the shield along the left-hand wall. The cover for the unit is an L-shaped piece of perforated aluminum.



# Happenings of the Month

## W6ZH CHOSEN UNDERSECRETARY OF STATE

Amateurs everywhere will be proud to learn that one of the most exacting responsibilities the nation can bestow has been conferred on one of our number with the appointment as Undersecretary of State of Herbert Hoover, jr., W6ZH and more recently also K6EV. In his new post,



W6ZH/K6EV

"Herb" Hoover will be second in command of the Department of State, under Secretary Dulles.

First licensed in 1920, when the "Z" calls were a special amateur experimental class, he has been hamming continuously ever since — except when special duties interfere, such as the recent urgent call by the Government to tackle problems in Iran. Favorite bands: 40 and 75 'phone. Favorite activities: rag-chewing and DX. K6EV at his summer home in Santa Barbara is in a deluxe building by itself at the edge of the beach, housing a KW-1 and a 75A-3. The present antenna is a 65-foot vertical yacht mast, with the radiator a copper wire imbedded in the wood. Construction of a 20-meter beam, interrupted by the Iran trip, will now probably have to await fulfillment of his present task. W6ZH in Pasadena is, generally, similarly equipped. He is a former member of the Pasadena Short-wave Club and currently of the Santa Barbara Amateur Radio Club.

Lifelong friend K6DI says, "Herb is 100% ham and amateurs are fortunate to have him in high office. Over a period of 34 years he has been

an indefatigable radio experimenter and is still as active on the air as his busy life allows."

Old-timers will recall it was just thirty years ago that the third in a series of national radio conferences, called by Herbert Hoover, sr., as then Secretary of Commerce, assigned amateurs our first short-wave bands. The former president, who recently celebrated his 80th birthday, was one of the staunchest friends amateur radio ever had.

The second generation now takes the limelight. A third may be in the offing — W6ZH's son is also a ham.

## NOVICE EXPANSION PROPOSED

At its meeting in May the Board of Directors of ARRL voted to seek from FCC an expansion of the present 7-Mc. Novice band so that it would become 7150-7200 kc. The text of the League's petition follows:

### FEDERAL COMMUNICATIONS COMMISSION

In the matter of a proposed amendment to § 12.23(e)(2)(ii) of the Rules and Regulations Governing Amateur Service

### PETITION FOR RULE-MAKING

Pursuant to Section 4(d) of the Administrative Procedure Act and Section 1.702 of the Commission's Rules and Regulations, the American Radio Relay League requests that Section 12.23(e)(2)(ii) be amended to provide for operation by Novice Class amateur radio operators in the band 7150-7200 kilocycles, instead of only 7175-7200 kilocycles as at present. The amended subsection would read:

"§ 12.23(e)(2) . . . (ii) 7150 to 7200 kc., radiotelephony using only type A-1 emission . . ."

This request is filed pursuant to a decision of the Board of Directors of the American Radio Relay League, Inc., arrived at its meeting in May, 1954. As the Commission is aware, the ARRL Board of Directors is composed of sixteen amateurs nominated and elected by approximately 42,000 licensed amateurs to represent them in the formulation of League policy.

\* \* \*

On April 18, 1952, the Commission released a Notice of Proposed Rule-Making, Docket 10073, which among other things proposed to make the segment 7175-7200 kilocycles newly available for radiotelegraph operation by Novice Class licensees under the usual equipment and power restrictions. On July 1, 1952, the League filed comment in this matter in considerable detail, endorsing the proposal but requesting that a larger segment, 7150-7200 kilocycles, be made available to Novices. On December 29, 1952, the Commission released its Order in Docket 10073, saying with respect to the above matter:

"... consideration of providing a larger segment for Novice operation in the 7 mc. amateur frequency band than that proposed preferably should be deferred until such time as experience with Novice operation in the space proposed has indicated the necessity for additional space . . ."

The Commission made final its original proposal for a 7175-7200 kilocycle segment for Novices effective February 20, 1953.

\* \* \*

In its earlier comment, the League said:

"It is, of course, fundamental that adequate privileges must be made available to accommodate the newcomers to amateur radio in the Novice Class. Yet, if the purpose for which the Novice license was created is to be served,



'adequate' privileges must not be so great as to cause such licensees to lose incentive for graduating to a higher and permanent grade of license. It is the League's belief that present low-frequency Novice privileges are not adequate by the above standards."

With one and one-half years of experience with Novice activity in the abbreviated segment of 7 mc., the League believes the above comment to be still applicable. The low-frequency Novice bands are crowded, more than comfortably so. The rate of influx of newcomers to amateur radio via the Novice route continues high. The 7-Mc. amateur band has traditionally been a popular one, and accordingly occupancy by Novices in this band has been great. The space available to Novices is simply not sufficient to permit useful training in order to meet the objectives of the Novice license.

Aside from mutual interference between Novice amateur stations in the 7175-7200 kc. segment, another major difficulty is disruption of communication by strong signals of high-frequency broadcast stations, mostly in Europe. As the Commission knows, in Europe the frequencies 7100-7300 kc. are available for broadcasting, and indeed considerable such use is made. With high powers, and especially under present propagation conditions, these stations put signals of extreme magnitude throughout the U. S. A. in afternoon and evening hours. It becomes necessary for Novice amateur stations using the 7175-7200 kc. segment to attempt to locate a usable channel in between broadcast carriers. When one considers that only two broadcast stations can thoroughly occupy most of a 25-kc. subband, the present difficulties of the Novice licensee become obvious. Expanding the frequency range available to Novices will permit them more freedom in finding "holes" in the European broadcast band through which to conduct their amateur communication training.

For these reasons the League requests the Commission to grant the additional segment 7150-7200 kc. for Novice operation.

AMERICAN RADIO RELAY LEAGUE, INC.  
A. L. BURLING, General Manager  
PAUL M. SEGAL, General Counsel

August 3, 1954

## TECHNICIAN EXPANSION PROPOSED

The ARRL Board of Directors has expressed itself in favor of a proposal to open the 50-Mc. band to Technician Class operators. Responsive to suggestions by Directors Crossley and Middleton, based on a specific proposal by James Price, W5FXX, the Executive Committee submitted the question to Directors for a mail vote. It is now expected that the Committee will shortly meet again and take formal action to establish the position of the League in favor of such a change in regulations.

Meanwhile, FCC has acted with a Notice of Proposed Rule Making aimed at the same end. The Commission also proposes, however, to let Technicians use the 144-148-Mc. band in addition to 50 Mc. Comment deadline is November 15th.

## GRAMMER'S 25TH

Technical Director George Grammer wouldn't hold still for a formal picture on the occasion of his 25th anniversary with the Hq. staff, August 26th. But catching him in action in the lab is,

come to think of it, far more commemorative of G. G.'s service to the League and amateur radio these twenty-five years.

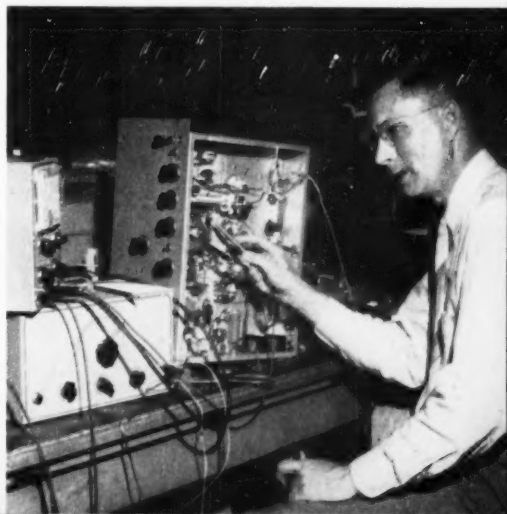
George had a spark station in Philadelphia in 1920, and an interest in the game dating back to 1914, obviously at a very tender age. In 1923 the rig became one of those spark-coil-c.w. outfits, and as 3A1H he worked six call districts. Inspired by this success, he put in a real tube outfit and worked the world. He gave up a transit company engineering post and came to Hq. in 1929 to handle the Technical Information Service. His first *QST* story, in December that year, described a single-control "t.n.c." one-tube transmitter which shortly became the standard beginner design for the *Handbook*. He soon became Assistant Technical Editor, and with Jim Lamb's departure, Technical Editor. The title of Technical Director was conferred in 1945 as more descriptive of his additional responsibilities in laboratory development programs, association with Government and industry technical committees, etc.

Over these past 25 years, the technical excellence of *QST*, the *Handbook* and other League publications, and the respect for authenticity given League views by Government and industry technical groups, is due in no small measure to Grammer's able handling of an exacting job.

"Gramp" is, incidentally, the sixth Hq. staffer to reach the 25-year mark.

## FCC DENIES VOICE EXPANSION — OPENS 6-METER DUPLEX

In early September FCC issued a report and order in Docket 10927. As concerns the ARRL request, made in 1952, for A9 (duplex) operation in 51-54 Mc., the Commission is adopting its proposal and is amending our rules to provide for such operation effective October 15th. As concerns the League's request, also in 1952, for expansion of the 14- and 28-Mc. 'phone bands, the Commission has dismissed its proposal for such expansion, citing principally its belief that more experience is needed with how the 21-Mc. band is going to fit in our family of amateur bands before an adequate appraisal may be made of any revision of 'phone allocations.



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WIDE  
◆

October 1954

# QST—Volume I

(Foreword to an Index by Sumner B. Young, WØCO)

THE first volume of *QST* is the smallest. From a scientific viewpoint, the twelve issues composing it are unimportant; but they gave impetus to the growth of the League. In September, 1917, publication was suspended after No. 10 of Volume II had been issued. Following World War One, publication of the magazine was resumed in June of 1919. Thereafter, the enterprise produced most of the League's revenue. Without *QST*, I believe the League would have perished. And had there been no League to formulate and to implement policies for our common good, during certain critical times, I am of opinion that amateur radio would have disappeared from the American scene—perhaps as early as the fall of 1921, when the "hams" collided with the broadcast listeners "in a big way," and when other radio services had commenced their efforts to appropriate large slices of the radio spectrum, even down below 200 meters.

Page 2 of the December, 1915, issue bears the following announcement.

*QST* is published by and at the expense of Hiram Percy Maxim and Clarence D. Tuska.

Its object is to help maintain the organization of the American Radio Relay League and to keep the Amateur Wireless Operators of the country in constant touch with each other. . . .<sup>1</sup>

The League did not own or publish *QST* until 1919; and the first issue displaying its name, as owner, was that of June, 1919. All of Volume I, and part of Volume II, were published under Tuska's supervision.

As I remember it, Maxim and Tuska distributed the first three issues of *QST* free to a large

<sup>1</sup> The need for embarking on some sort of enterprise which would bring in some cash is candidly explained at 7 to 8, December 1915. Sales of "List of Stations" books, message blanks, and "License Certificates" had been disappointing. The Officers of the League had been forced to "go down into their own pockets" to pay League expenses, and wanted to regroup.

<sup>2</sup> In January, 1916, Maxim and Tuska were soliciting subscriptions for the February, March, and April issues. See 2, 17, and 21, January 1916. The first published solicitation for full-year subscriptions is found at 18, February 1916.

<sup>3</sup> See the "Monthly Statement" at 350, November 1916, where Tuska is described as the only person holding 1 per cent, or more, of the stock. Note, also, that Warner's editorial on page 9 of the December (1940) *QST*—the so-called "Silver Anniversary" number—states that Tuska went heavily into debt, in order to publish *QST* between April and September, 1917; and that this editorial also remarks that in 1919 ". . . Tuska wanted to get into manufacturing and the League wanted to own *QST*. With money borrowed from its members, the League acquired the magazine, [and] enabled Tuska to pay off his debts. . . ."

• Here, despite its involved form, is a saga of early amateur radio that we wager you won't be able to put down unfinished. Before starting this history be sure to read the editorial in this issue.

list of licensed amateurs; and I now have in my collection copies of the first two numbers, bearing on their front covers the words "Sample Copy." A red-ink rubber stamp was used. In any event, Mr. Tuska (see 22, December 1940) states that the first issue (December, 1915) "was sent to all the League members and to all the other amateurs listed in the government call book." The only subscriptions originally solicited were for the three issues of the magazine which followed that first number. (See 22, December 1940; and 2, December 1915.)<sup>2</sup>

The masthead of the October, 1916, issue indicates that there was also an intermediate owner-and-publisher status.

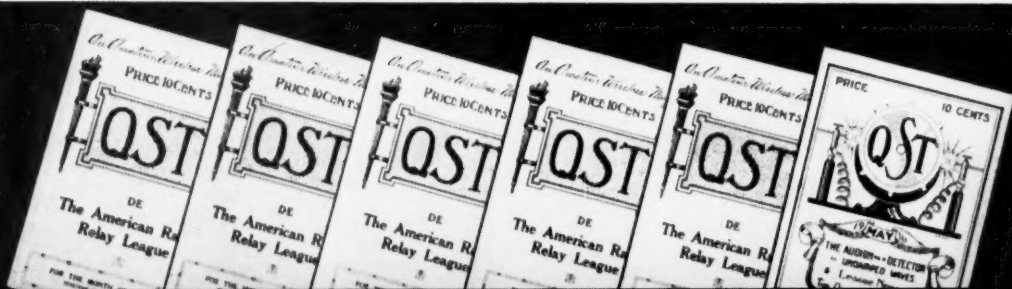
*QST* is published monthly by The *QST* Publishing Company, Incorporated at Hartford, Connecticut. . . .

This corporation was organized to "insulate" Maxim and Tuska from possible libel suits arising out of the publication of *QST*, as an editorial found on page 302 of that issue explains.

By November, 1916, however, Tuska had become owner of at least 99% of the stock of this new corporation, and was probably sole owner.<sup>3</sup>

Warner's description of the early days of *QST*, contained in his editorial at 9, December 1940, is well worth quoting:

. . . Our first editor and business manager, Tuska, was then a college day student in his late 'teens, *QST*'s office an attic room in his home, his office hours what he could spare from study. His fundamental management policy was to cast up a month's cash receipts, find out how many copies he needed to print, and ask the printer how many pages could be printed in that quantity for that money. Because *QST* really was "of, by and for the amateur" it grew quickly, soon was invaluable. It reached its pre-war peak in April of 1917, at that time sported both a part-time stenographer and a part-time advertising manager. Then came the war and, after a few issues devoted largely to recruiting, Tuska got out a final September issue and himself joined the Signal Corps, heavily in debt for those last few months of operation. . . .



For an entertaining and valuable review of each issue of the magazine contained in Volume I, I recommend "QST's Diary, Volume I," found at 22 to 24, December 1940. C. D. Tuska is the author.

Even as early as August, 1916, Mr. Maxim was of the opinion that the talents and facilities of the League were valuable in the field of national defense. His letter to Mr. Josephus Daniels, Secretary of the Navy, dated August 7, 1916, contains a significant description of the League, and of the communication system which it had developed:<sup>4</sup>

... Its membership consists of over six hundred amateur radio stations in thirty-eight states of the Union. Except for gaps in the southern tier of states, we are able to communicate to all important points at the present time.<sup>5</sup>

... In order to insure transmission along trunk line routes, the Bureau of Navigation have issued to certain stations indicated by this League, a Special

License to use a transmitting wave length of 425 meters. The regular amateur is limited to 200 meters. Several of the Special Licenses have already been issued where the geographical location suggests their value. During the next sixty days, we hope that several new Special Licenses will be issued to stations in the Middle and Far West, which will be of great assistance to us in reaching Pacific Coast points with certainty and despatch.

The American Radio Relay League consists of middle-aged men, young men, and boys.<sup>6</sup> There are many men of wealth in the membership, and who make wireless telegraphy a form of recreation. Many of our stations have had no expense spared upon them, and are equipped better than most commercial stations. The management of the League is in the hands of businessmen. The writer is the founder and chairman.

Some of our stations have already been of public service in establishing communication when floods have prostrated the regular telegraph and telephone lines.<sup>7</sup> ... Most of our membership is along the Atlantic and Pacific Coasts. ...<sup>8</sup>

<sup>4</sup> 3 to 4, December 1915.

<sup>5</sup> This statement should have been qualified, in my opinion. No part of the system was reliably in touch with all other parts of the whole; and no transcontinental relay message was successfully transmitted until January 27, 1917. See Volume II, at page 18 of the April, 1917, issue. The first two-way spanning of the Continent in one night occurred on February 6, 1917. See 17, April 1917.

<sup>6</sup> Strangely enough, no old men are mentioned. I wonder if this apparent lack of "graybeards" had any influence on Maxim's choice of his pen name, "The Old Man"?

<sup>7</sup> 4, December 1915. The Maxim letter gives no specific instances where services were rendered to the public in any emergency — floods or otherwise. This seems to be the first reference to such work ever published in QST.

Back in June, 1915, Charles E. Apgar, Westfield, New Jersey, had rendered a very outstanding service to our Government — but not in the field of emergency communication. At his amateur station he had made phonograph records of long-wave transmission from Sayville, L. I. (WSL); and these recordings, when analyzed carefully, had disclosed violations of the U. S. Neutrality Laws. Under the very noses of the official censors, that station had been transmitting code messages to POZ (Nauen, Germany).

Only a small part of the story appears anywhere in QST. See Volume II of QST, at 30, December 1916, and at 7 to 9, September 1917 (in "Something Rotten Somewhere").

As I recall it, the incident was given wide publicity in American newspapers when the information was released.

A good account of Apgar's exploit appears at pages 44 to 45 in the late Clinton R. De Soto's book, *Two Hundred Meters and Down*. Radio Inspector L. R. Krumm, of the Second District, who had visited 2MN (Apgar's station), told Chief W. J. Flynn of the U. S. Secret Service that Apgar might be of help.

Mr. De Soto, at page 45 of his book, says: "On July 8, 1915, the tale of Apgar's assistance to the government was released to the press. It was described as 'the most valuable service ever rendered by a radio operator to this country.'"

<sup>8</sup> See 185, July 1916, as to the geographical distribution of amateur radio stations in the U. S. A., and for other interesting data. A table on that page furnishes information re the average power, per licensed station, in each of the 9 Districts, and the number of 1000-watt stations in each District. At 163, July 1916, Edgar Felix, who compiled this table, says: "... I feel sure it will be of interest to the

amateur world to note that the average power of licensed stations in America is only 259 watts. ... (Note that special amateur stations are omitted from the list.)

The table itself shows that the Eighth District leads in the number of stations licensed (858) and in the number of one-kw. "rigs" (67). In second place, as to the number of licensed stations, is the Third District, with 728 — but it places only fifth in the number of one-kw. stations, with 23. In third place, as to total number of licensed amateur stations, is the Second District, with 602. Its "full-gallon" stations, however, number only 35 — placing the Second District fourth in that category. The Sixth District is listed in fourth place, in the number of licensed stations (570). Its one-kw. licensed stations (43) win it third place (among the 9 Districts) in that classification. The Seventh District comes next, in number of licensed stations (519). One-kilowatt "rigs" (in the Seventh District) number 23 — which is the same figure as that given for the Third District. This is good for a tie for fifth place, in the "high-power" category. The New England States, comprising the First District, place sixth in total licensed stations, with 472. First District 1-kw. "rigs" number only 17. Counting the Third and Seventh Districts as being tied at fifth place (in the "high-power" column of this table), this figure places the First District in sixth position, there. The geographically-huge Ninth District is in seventh place in the total number of licensed stations (464). Its "thousand-watters" reach a total of 50, however; and that figure is good for second place in that "select" column of the table. In the Fifth District, Mr. Felix lists only 75 licensed amateur stations — a big "drop-off" from the figures relating to the other districts which we have mentioned. Only 8 one-kw. stations are shown in this same district. Last in the total number of licensed stations, and also last in "1000-watters," comes the Fourth District. It has 73 licensed stations and only 2 1-kw. "rigs."

Mr. Felix gives the total number of licensed amateur radio stations in the United States as 4360; and the total licensed one-kw. amateur stations in the country as 268 (6.1% of the first figure). Unfortunately, he has not dated his table; and he has failed to identify his source-materials, except as the "U. S. list of amateur stations." My guess is the figures are of 1915 vintage.

As to "average watts per station," Mr. Felix gives the following data: the Ninth District rates first, with 432 watts; the Fifth District rates second, with 293 watts; the



Drawing on my own recollection of the type of communication which (in fact) could be carried on between amateur stations in 1915 and 1916, as observed from my first licensed amateur station (1CO, located at Dorchester, Massachusetts), and after rereading the reports on station activities published in Volume I of *QST*,<sup>9</sup> I feel obliged to state that this ARRL network of amateur stations was a crude one, and that it was not really capable of producing much in the way of reliable or quick communication, either on a day-to-day basis or for limited emergency periods.

However, the men and boys who ran these amateur stations were gaining experience which was to be of considerable value to the nation during World War One; and, in later years, emergency communication in times of floods, tornadoes, ice storms (and the like) became of material importance.<sup>10</sup>

The Army and Navy executives probably were aware that the amateur communication system itself was of very little practical use to them; but I feel sure that they did have their eyes on the amateurs themselves. The Maxim letter drew from the Secretary of the Navy a polite reply<sup>11</sup>; and a similar letter to the Secretary of War was answered (by the Acting Chief Signal Officer) in a courteous, but noncommittal, manner.<sup>12</sup>

It is a matter of common knowledge that when the United States entered World War One, in 1917, the "hams" joined the armed services in large numbers, and that they proved to be of considerable value in communication work. Volume II of *QST* contains part of this story,<sup>13</sup> and other fragments of it appear in Volume III.<sup>14</sup> However, there are many gaps, and the records published in *QST* are unsatisfactory.

Sixth District is third, with 287 watts; the First and Eighth Districts are tied for fourth place, with 271 watts apiece; the Second District is in fifth position, with 250 watts; the Fourth District occupies sixth place, with 203 watts; seventh place falls to the Third District, with 185 watts; and — last in the procession — comes the Seventh District, with only 160 watts.

<sup>9</sup> See: 65 to 69, April 1916 ("Washington's Birthday Amateur Relay Message," by 9XE); 80 to 81, April 1916 ("Letter, re trunk lines, from M. B. West"); 95 to 96, May 1916 ("Monthly Report of Trunk Lines 'C' and 'D'", by A. A. Helbert, 2ZH); 97 to 98, May 1916 (report of R. H. G. Mathews, 8IK); 129 to 130, June 1916 ("Western Trunk Line Report," by R. H. G. Mathews); 166 to 167, July 1916 (Pacific Coast Trunk Line Manager's report. Note that a map of Relay Routes appears on page 167 of that July, 1916, issue); 169 to 170, July 1916 ("Some First Class Relay Work" and "A Few Suggestions," by S. Kruse); and 221, August 1916 ("A Trunk Line Criticism," by K. B. Warner. This letter, by the way, marks Warner's first appearance in *QST*. Mr. Tuska is in error when he says — at 24, December 1940 — that in the period May to September, 1917, "A ham named K. B. Warner crisscrosses the pages of *QST* for the first time — he got two letters published." Warner had another letter published at 24 to 26, June 1917, and still another at 34, August 1917).

<sup>10</sup> It must be admitted that the few instances of emergency work enumerated in the first five Volumes of *QST* are unimpressive. Before use of c.w. transmitters had become widespread, the proper "tools" were lacking.

Published accounts of so-called "emergency work," in the first five Volumes of the magazine, are as follows: Volume I: 51, March 1917 (local contact, between 1DX, Stamford, Connecticut, and two battleships lying in Stamford Harbor, when a portable Navy field station fails). Volume III: 25, December 1919 (see "Strays," Clifford J. Vick, Houston,

Turning to "outside" sources of information, as to the amateurs' contribution to the war effort, I find that according to Mr. DeSoto (pages 51 to 52 of *Two Hundred Meters and Down*) there were over 6000 amateurs in the United States when this country entered World War One. And (at page 52) he says:

... While the records have never been fully tabulated, it is generally believed that between 3500 and 4000 amateurs saw military service during the period of the war, probably more. . . .

The magazine soon demonstrated its appeal. The amateurs approved it. Through its pages they certainly began to become acquainted with each other. I know I used to read *QST* from cover to cover, and that I particularly enjoyed the letters from various "hams," the station descriptions, reports of DX work, and the brand of humor displayed.

Speaking of humor — it was in Volume I that "The Old Man" (who was Maxim, himself) published his first article. This was a "serious" work, entitled "Running Tests Between Amateur Stations."<sup>15</sup> His second story, called "Rotten Sending,"<sup>16</sup> probably was not intended as a humorous affair; but it did possess a certain grimness of expression which was entertaining. The title contained the word "Rotten," and this soon became the "trade-mark" for The Old Man's series of "side-splitters" which were later published in this (and subsequent) Volumes. The third effort, "Rotten Luck,"<sup>17</sup> was recognizable as a special type of amateur literature. The Editor affixed a headnote to it, which read:

The "Rotten Articles" by The Old Man are becoming a source of keen enjoyment every month.

Texas, gives the newspapers in that city "the first authentic news of the storm's location and the destruction taking place," when a tropical disturbance hits the lower Texas coast, in middle-September, 1919, "resulting in the destruction of Port Aransas and immense loss of life at Corpus Christi." How he got this information is not shown). Volume IV: 40, October 1920 (Moore, 1BB1, copies an SOS transmitted by the S.S. *General Goethals* concerning the S-S disaster. He gives news of this to the A.P., which, in turn, informs the Philadelphia Navy Yard); 44 to 45, October 1920 (a Chicago ham — W. J. McGuffage — hears a message broadcast from a mail plane re delayed arrival and delivers it to P. O. authorities); 47, February 1921 (Cushing, 1EBF, Duxbury, Massachusetts, relays traffic from the U. S. minesweeper *Sean*, ashore near that place, during a bad gale. This was an outstanding job, by the way); 36, March 1921 (1NAQ and 1JQ report large fires in Springfield, Massachusetts, and in Tariffville, Connecticut, to the press); 53 to 54, July 1921 (1AW and 2EL handle some press items during an auroral disturbance). Volume V: 40, October 1921 (Colorado floods disrupt wire communications for three days. Amateurs try to help, but authorities forbid them to carry a portable radiophone into Pueblo); 23 to 24, November 1921 (flood, in New Mexico's Rincon Valley, wipes out the town of Hatch, and does other damage. Portable station 5FY is set up at Rincon, and handles messages re relief needs with 5ZJ, at Mesilla Park. He telephones them to Las Cruces. Wires soon restored); 35 to 36, March 1922 (8SP, 8EF, and 8AFD send messages for a power company, during a sleet storm); 67, 75, April 1922 (a blizzard and ice storm in the Minneapolis-St. Paul, Minnesota, area. Lines are restored before improvised amateur relay routes handle any traffic. Amateurs copy NAA press items, and supply them to local newspaper); 19 to 20, June 1922 (ice storm in Fox River Valley, Wisconsin, 9ZL, at Noenah, works WMW, at Manitowish, on 600 meters. Various ama-

Several of our readers have inquired as to who writes them. Frankly, we don't know, but we are sure they come from one of our League helpers. About the first of each month we discover one of these articles in our monstrous stack of mail — each time with a new postmark. We are afraid to search for the writer for fear we shall kill the goose who lays the golden eggs. This one's gold all the way thru. Don't fail to read it. What will "The Old Man" send us next time?

In "Rotten Luck" the author's thesis, to which I heartily subscribe, was this:

... There is something about radio work which attracts rotten luck. I have noticed it several times. Just at the time when you want things to be their best, is the time the worst luck steps in and makes them act their worst. ...<sup>18</sup>

For a good chuckle I also recommend Lloyd Manuel's reminiscences of very early amateur radio times, entitled "Thoughts of the Good Old Palmy Days."<sup>19</sup>

The most "modern" station described in Volume I is not (strictly speaking) an amateur station. It is the "Modern Experimental Radio Telegraph and Telephone Station" of A. H. Grebe, a manufacturer of amateur radio apparatus, located at Richmond Hill, Long Island, N. Y. This "shack" was equipped with:

- (a) a 500-cycle quenched-gap spark transmitter;
- (b) a storage-battery-operated spark-coil set, for local work;
- (c) a small radiotelephone transmitter which generated a carrier wave by means of an arc which burned in alcohol vapor and was pow-

- ered by a 350-volt d.c. generator; and
- (d) another small radiophone "rig," which produced a carrier by means of a large vacuum tube. This last set was supplied with plate power by a small 900-volt generator. Its filament supply was a 30-volt storage battery.<sup>20</sup>

The only other "undamped" transmitter (used at an amateur or quasi-amateur station) which I have found described in Volume I<sup>21</sup> is a perfectly ghastly affair, *Sixty-cycle a.c.* supplied power to a crude arc, inductively coupled to an antenna system. A carbon microphone, inserted in the ground lead, supplied a small degree of modulation.

Seefred brothers (6EA, Los Angeles, California), devisers of this set, published the following information:

... The diagram is self-explanatory with the exception of the gap which is made of two extremely hard carbons such as are found in dry cells. A close adjustment is necessary and it is left to the experimenter to develop this with the material on hand. The arc must be of purple blue color to get the best results. If the arc turns to a white glare, it shows the carbons are burning.

... The writers have experimented three years with this sixty-cycle phone and have talked twenty-two miles from Los Angeles to an amateur at Long Beach. They were also heard by another in Pomona, California, thirty miles distant.<sup>22</sup>

In view of the absence of any evidence (in this first volume of *QST* tending to show a general trend toward the adoption of "undamped" methods of transmission by American amateurs, a

(Continued on page 130)

tears — most of them using spark coils — work with 9ZL and other stations on lower waves); 55, June 1922 (Canadian 9AL, Toronto, handles messages re power company cable repairs with 9AL and 8ANJ, at Niagara Falls. No details given); 52, July 1922 (see "Strays," J. F. Carpenter carries a small c.w. set to St. Croix Falls, Wisconsin, during a storm, and handles power-company messages to Minneapolis over a 60-mile gap).

<sup>14</sup> 4, December 1915.

<sup>12</sup> 4 to 5, December 1915.

<sup>13</sup> 25, May 1917 (R. H. G. Mathews is Naval Censor at Grand Haven and Benton Harbor, Michigan. 9ALM, 9OX, 9VY, 9GY, 9NN, and "more of our long-distance friends" are to serve as operators under him); 3 to 6, July 1917 ("Wanted: By Uncle Sam: 2,000 Amateur Wireless Operators"); 5, July 1917 ("Personal Mention of Members in Service"); 20, July 1917 (R. H. G. Mathews is a radio gunner in the USNRF. So are Mr. West of 8AEZ, and Mr. Graf, of 9RP, who are also naval censors. A list of amateurs who have enrolled in the USNRF is also given); 21, July 1917 (Prof. A. Hoyt Taylor, 9XX, is a lieutenant in the USNRF); 21, July 1917 (Mrs. Candler, 8NH, of St. Mary's, Ohio, has enlisted in the Naval Reserve); 23, July 1917 ("In the Service"); 17 to 18, August 1917 ("In the Service," by Bill Woods, 9HIS); 23 to 24, August 1917 (letter of James A. Crowlous); 25 to 26, August 1917 (letter of Walter W. Maynes); 26, August 1917 (letter of Donald H. C. O'Neil); 25, September 1917 (H. R. Hall, 9CF, is in the USNRF at Duluth, Minnesota); 22 to 23, 25, June 1919 ("Personal Notes").

<sup>14</sup> 14 to 15, August 1919 (amateurs are invited to submit names of hams who died in service during World War One); 29 to 30, November 1919 (war records of R. H. G. Mathews and Fred H. Schnell discussed); 30 to 31, 39, November 1919 ("U-Boat Radio," by J. A. Crowlous); 46, December 1919 (partial list of names of amateurs who died in service); 20,

January 1920 (war record of Lieut. Edward A. Gisburne — winner of the Congressional Medal of Honor during the Mexican troubles in 1916 — mentioned); 43, May 1920 (re Lawrence B. Robinson, deceased); 21, July 1920 (big receiving loop built at Otter Cliffs, Maine, by Bill Woods).

<sup>15</sup> 8 to 9, January 1916. The secret of Maxim's identity was well-kept. It was not disclosed, in *QST*, until after his death. See Volume XX, at 13, April 1936. Prior to that time, a few persons may have known who "T. O. M." was — but they didn't talk.

<sup>16</sup> 98 to 99, May 1916.

<sup>17</sup> 191, 233 to 234, August 1916. At 11, July 1920 (in Volume III), there is an announcement which declares: "Some day we are going to publish The Old Man's 'Rotten Radio Yarns' in book form. Certainly his inimitable stories have added much fun to Amateur Radio, and should be preserved. What do you think? — Editor" I have always been sorry that this book was never printed.

<sup>18</sup> 191, August 1916.

<sup>19</sup> 47 to 48, March 1916.

<sup>20</sup> 288 to 292, October 1916.

<sup>21</sup> At 59, March 1916, it is announced that the Editor will shortly describe (in *QST*) a 60-cycle a.c.-powered radio telephone with which he has been experimenting. With a power of one-eighth kilowatt, the apparatus is said to have transmitted music over a distance of 25 miles. However, this promised article never did appear. At 322, October 1916, it is announced that League Hq. is going to try out a DeForest 1½-kw. "Oscillon" tube transmitter, on a wave of about 600 meters, at station IZM; and it is said that this transmitter is rated according to power delivered to the antenna, and not as to primary input. I have found nothing in the first five volumes of *QST* to indicate how these tests with the "oscillon" "panned out," at IZM, if they were ever made.

<sup>22</sup> 250, 278, September 1916.





# Correspondence From Members-

The publishers of *QST* assume no responsibility for statements made herein by correspondents.

## CODELESS LICENSE

134 Manor Lane  
Ft. Thomas, Kentucky

Editor, *QST*:

After reading Mr. Frank W. Wenzler's letter in August issue *QST*, I decided to dig up a few reasons for him. I could think of no better place to turn for them than *QST* and so I have here several excerpts from an editorial in the August, 1948, *QST*. They come under the heading, "The Importance of C.W.":

"In the first place we have to put it down that there is something basic about c.w. telegraphy. Every amateur ought to be proficient in it. It isn't so much that telegraphing skill is what distinguishes us from most other radio services — although we do think it true that the country has the right to expect each one of us to possess that skill. A more important factor is that c.w. provides more reliable communication under difficulties and that, as purveyors of communication in times of urgency, we need to have it available and to be able to use it. But even that isn't the main point. The chief factor is that c.w. constitutes the most effective use of frequencies in an increasingly-congested spectrum and that we simply must count on the major portion of our activity in our lower bands continuing by that means. It is the only method by which we can hope to accommodate all the world's amateurs in our busier bands. We couldn't possibly find room for ourselves if we were all 'phone. Because of the channel-width required, 'phone congestion is so immense, so many layers deep, that it has been argued that if the entire expanse of these amateur bands was available to that mode the improvement wouldn't be noticeable. What 'phone needs is not half again or double its present space, but many times as much — which of course simply doesn't exist. . . . As long as our present circumstances endure, as long as our problem is to accommodate the largest possible number of stations in a limited band, 'phone operation can't be thought of as an inherent right. It has to be recognized that in actuality it is a special privilege, one that is feasible from the engineering standpoint only to the extent that it does not interfere with the rights of others to enjoy also a place in the spectrum, or to the extent that it provides occupancy of frequencies that otherwise might not be used effectively.

"Another thing that deserves to be said is that the exclusive practice of telephony does not make a well-rounded amateur nor one fully capable of discharging his obligation to society and the country. An amateur who has never attained code proficiency has missed something basic, is only half an amateur. When a man has served his code apprenticeship and earned his chevrons, and knows what the game is all about, he has the right to make an election and to work mostly, or even all the time, on 'phone if he so chooses — but he should first have acquired a foundation in what is inescapably the basic form of amateur communication. . . ."

— Jim Hanlon, W4VIV

P. O. Box 1328  
Anchorage, Alaska

Editor, *QST*:

I want to be put on record as definitely favoring the abolishment of any code examination for amateur radio, and a much stiffer technical exam. We are no longer in the spark days, fellows; this is the era of advanced techniques: s.s.b., TVI suppression, f.s.k. teletype, and pulse. We must keep up with the times. The Technician Class exam was a step forward but it didn't go far enough.

Let's get with it, boys, let's bring our exams up to date as has been done with the commercial exams the FCC is now giving. Perhaps a workable system would be a General

Class exam equivalent to 2nd Class commercial 'phone exam, the Advanced Class (if needed) could be on a par with 1st Class commercial 'phone or the Extra Class theory exam. In any case there should be no restrictions of bands. A c.w. endorsement could make the ticket valid for those interested in that field. The FCC, already overloaded with work, could be spared much if credit were given to commercial licenses. Since they have demonstrated their technical ability, an element covering amateur law should suffice.

These are my thoughts in the matter; let's put this to our membership (including Associate members) and then petition FCC to make revisions consistent with the times.

— Kenneth D. Hopper, W3ZML/KL7

518 W. 147th St.  
Gardena, Calif.

Editor, *QST*:

I take issue with the letter from Mr. Wenzler and other similar tirades against c.w. being a part of the FCC amateur exams. In the first place, I agree that it would be very convenient if we could eliminate from any examination the part we thought we could not learn, or the part we thought we would never use. Eliminate any questions about city driving on your driving exam because you intend to drive in the country, or being more realistic, eliminate any question pertaining to xtal oscillators because we prefer a VFO? Yes, indeed, if throughout our lifetime we could have ordered any examination we took and had only to pass just the parts we wanted to, life up until now could have been pretty much of a snap.

— Richard Gorom, W6NRR

5514 N. Orangecrest  
Azusa, California

Editor, *QST*:

My wife and I agree with Mr. Wenzler. My wife thinks his main idea should be carried a little further. My wife is a good driver, but she is absolutely not interested in learning what all those arm signals and traffic signs mean, so why not a driver's license for people who aren't interested in them?

I'm coming to the conclusion that there is no reason why I should send my 5-year-old son to school. After all, he can talk quite well and he just doesn't want to learn all those hard ABC's.

— Robert G. Parks, K6AEC

123 Jahmke St.  
Gonzales, Tex.

Editor, *QST*:

Mr. Wenzler, I'm sure you will agree that the government does not owe a person a living . . . by the same token, the FCC does not owe a person an amateur ticket. From one who used to feel very much as you do now, there is a great feeling of accomplishment when you have that ticket in your hand. At any rate whether you prefer 'phone or c.w., unless you operate both, you are missing a lot.

— S/Sgt. Ruel P. Edrington, W5PNM

4978 Keppler Rd.  
Camp Springs, Md.

Editor, *QST*:

The beauty of the present arrangement is that the acquisition of an amateur operator's license requires an honest effort on the part of the prospective ham. Were it not for the c.w. requirement, the ether would be flooded with erratic electromagnetic nonsense. No one is denied the pleasure of amateur radio because of the code requirement anymore than a college student is denied a degree in engineering be-

cause he fails to fully appreciate English literature. After all, oysters might not be everybody's favorite, but leave us not deny their nutritional value.

— Paul E. Schmid, jr., W3OHC

320 Ashby St.  
Alexandria, Va.

Editor, QST:

Ever since I can remember, amateur radio has been a vaunted aid to those in distress and emergency situations. In fact it has become famous for its good works in this respect.

Would anyone really desire, including Mr. Wenzler, that Joe Doaks be caught in a less-than-hopeful situation beating out his feeble message using loose wires as a key and with the knowledge that perhaps the only ham hearing his signals may not have been required to know International Morse to get on the air? I think not.

— Charles E. Hedrick, W4WO

1051 Lalor St.  
Trenton 10, N. J.

Editor, QST:

The major reason why amateur radio exists today is because we form a skilled communications reserve for use in time of emergency. When disaster strikes, a c.w. transmitter can be thrown together more easily and quickly than even the simplest 'phone rig. It also takes a lot less power to run it. C.w. will get out under conditions that would be impossible for 'phone. Now if we had a lot of amateurs whose c.w. knowledge was nil, they wouldn't be very valuable in an emergency. Since it only takes a few members to ruin an entire group, this would give certain powers-that-be a good excuse to legislate hams out of existence and give the ham bands to the commercials.

— Charles T. Tart, K2CFP

Box 170, R.D. #2  
Bervillie, Penna.

Editor, QST:

Mr. Wenzler decries the chirps, thumps and clicks on the c.w. bands. However, he has such a distaste for c.w. that must conclude that he rarely listens to the stuff and can't tune it properly when he does. So how would he know a chirp, click, or click when he heard one?

He says the "real amateur" gets into every phase of ham radio. If he wants to become a "real amateur" he'll have to include c.w.

The payoff is his assumption that the 'phone operator is some infallible and angelic genius, whose technique is the delight of Dr. Lee DeForest, while the c.w. man is a slinking villain, whose sole infamous purpose is to annoy TV viewers and BC'ers with his nefarious antics.

— Arthur Gandert, W3OLG

4817 N. Albany Ave.  
Chicago 25, Ill.

Editor, QST:

Sure, it takes time to get the code speed up where it belongs. I ought to know. I had to try five times before I got my General Class ticket, but believe me, when I finally opened the envelope and saw the ticket, I sure felt good about it.

— Marshall E. Freedman, W9RLX

[EDITOR'S NOTE: We regret space does not permit excerpts of letters from the following, who also wrote in opposition to the codeless license: W1s JNO, RCA, YKA; W2RME; W3s QV, UXO, YDF; W3s WYK, ZLD; W4s EFW, IKK; YOT, YYC; W5s MSH, RKZ, TLQ; W6s DTY, LXY; K6s ELLT; W7s WKG, THY; W8s KXL, NSA, SFD; W9s FDY, LQE, LQL, ZNA; W0s IA, PFD, CMU; KL7BBV.]

## TV SET RADIATION

11505 Lake Shore Blvd.  
Bratenahl, Ohio

Editor, QST:

Many thanks to the guy [W6KJN, "On the TV Front," Sept. QST] who finally found the answer to my toughest problem in ham radio—the guy who finally showed me how to stop TV from putting out signals (ITV) in the amateur bands.

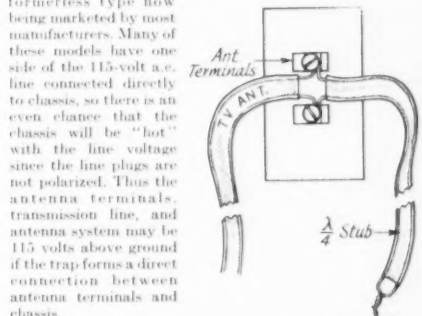
I do a lot of 160-meter work and always have had a good time on that band until the family turned on the one-eyed monster to watch their favorite program. When I'd work someone, unless his signal was 88 it would be knocked out by the television set's spurious radiation. I tried everything—every kind of television antenna. This didn't work either. It finally got to the point where the family and I had to take turns.

My problem is solved now because of the article in September QST. I now very faintly hear the signals the television set puts out on 160. On the other bands, I can't even hear the slightest signal from the television set.

Many thanks because the family is now enjoying television while I enjoy ham radio at the same time.

— J. Mihalco, W8MJF

[EDITOR'S NOTE: WIZEO has called our attention to the fact that a trap used as shown in September QST may represent a shock hazard if the TV set is one of the transformerless type now being marketed by most manufacturers. Many of these models have one side of the 115-volt a.c. line connected directly to chassis, so there is an even chance that the chassis will be "hot" with the line voltage since the line plugs are not polarized. Thus the antenna terminals, transmission line, and antenna system may be 115 volts above ground if the trap forms a direct connection between antenna terminals and chassis.



To avoid this the trap should be used with a blocking condenser as shown in the accompanying diagram. The ground symbol indicates the chassis connection recommended by W6KJN. Wrap some tape around the joint between the trap and blocking condenser to prevent an accidental short, and pull the line plug out of the wall socket before touching the chassis.

Incidentally, WIZEO is the author of an article on cutting down TV receiver radiation which appeared in Sept., 1954, *Radio & Television News*.

## Silent Keys

IT is with deep regret that we record the passing of these amateurs:

W1WTD, Richard A. Watson, South Brewer, Me.  
W2VTP, Harry A. Patrick, Saddle River, N. J.  
ex-W3ADD, Dr. A. D. Dudley, Norfolk, Va.  
W3GH, George W. VanKirk, Forty Fort, Penna.  
W4JQV, Roy S. Quinn, Henderson, Ky.  
W4NG, Edward J. Day, Warrenton, Va.  
W5AIZ, Mike G. Seiders, Austin, Texas  
W5BHY, Ralph S. Levy, Houston, Texas  
W6DCL, Edwin H. Cunha, Salinas, Calif.  
W6KWD, Oren E. Sanders, Spring Valley, Calif.  
W6WVP, Thomas J. Parker, San Diego, Calif.  
W6ZJ, Don R. Lewis, Inglewood, Calif.  
W7UYB, Philip A. Pickens, Phoenix, Ariz.  
W7WBI, Hal M. Halverson, Grants Pass, Ore.  
ex-W8DPO, Ross Arrick, Wheeling, W. Va.  
W8ICV, Morris White, Detroit, Mich.  
W8KQC, Frederic J. Stevens, Grosse Pointe, Mich.  
W9RUM, Paul G. Cliver, Watseka, Ill.  
W0CUM, Edwin Junkert, Fargo, N. Dak.  
KP4DZ, Clarence R. Landress, San Juan, P. R.  
KP4RJ, Francis McN. McCown, Santurce, P. R.  
PY7WS, Antonio Batista Vieira, Fortaleza, Ceara, Brazil



## Final Returns, 20th ARRL International DX Competition

*Over 150 Countries Take Part; Certificates Go to 305 Participants*

BY PHIL SIMMONS,\* WIZDP

**O**LD SOL is responsible for more than night and day, sunburns, and the carbon-nitrogen cycle. The quantity and position of his spots also play a major part in determining how successful a DXer will be in his pursuits. For some time now DXers — indeed, all communicators — have been accorded unspeakably harsh treatment by this rosy-visaged ball of fire.

Remember when you used to fill your European quotas on 10 meters? It isn't so long ago as might be believed, as all ARRL DX Tests from 1947 through 1950 were marked by such doings. Then in '51 the bottom fell out. This was apparent not only from the wailings of participants re-reduced scores but also from the number who submitted logs — about half of the 1950 amount. The low-power man, who could compete with the best of them on 10, was especially hard hit. This unsavory state of affairs remained in force through '52 and '53 and, to a lesser degree, in the DX Test of last February and March.

Certain signs portend better days at hand. Over 150 countries were active, a high for recent years. Daytimes, we're told, some were hard put to choose between 15- and 20-meter operation — the scarce stuff was that plentiful — and on occasion there was the same crucial decision betwixt 3.5 and 7 Mc. in darkness hours. While the North

America-to-Europe path on 28 Mc. just *wasn't*, a smattering of work on that band *was* reported. The number of logs, an index strongly prognostic in the past, leaped 23 per cent in '54, the first significant increase since the postwar bust. Scores, 'phone and c.w., are zooming upward. ARRL will issue 305 Certificates of Performance — 48 more than last year — in these categories: 155 to c.w. and 118 to 'phone leaders in their countries and sections, and 32 to club winners.

So let's not despair! It's been rough sledding but it looks as though we've made it through the lean years of the sunspot minimum. From now on things are looking up!

### C. W. Highlights

Atop the W/VE heap in the code fracs we find a new ace, Al Gennaro, AI, W3NOH, plodded away at the W3CTJ station to score a whopping 452,394 points — 613 contacts and a 246 multiplier doing the trick. For 86 hours he darted into those fierce pile-ups and — it goes without saying! — emerged victoriously more often than not, getting 115 countries altogether and 102 on 14 Mc. alone. The well-executed *coup d'état* came about through astute planning by Al and Maury, W3CTJ himself, as both fellows pooled their equipment but not their operating talents. Three rigs were brought into play: (1) the usual W3CTJ transmitter, a 310-B driving p.p. 4-100As at one kw.; (2) Al's home station, imported for the occasion, an HT18-813-304TL at one kw.; (3) a 50-watt 807 job, this to scoop up stray 160-meter multipliers. Antennas: 160-meter dipole, ground-planes for 40 and 80, 3-element beams for 15 and 20. The reception duties were capably performed by an HRO-50, 75A-2 and RME-99.

«

Chad Knowlton, owner-operator of W1ATE.

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**QST for**





The hue and cry in DX circles might well be: "Alas and lackaday, why don't I live in Philly!" For archprotagonist W3BES made his customary strong bid with 431,244 points, by virtue of 594 contacts and a multiplier of 242. Jerry's 90-hour keying stint rewarded him with QSOs in 112 different countries and easily merited second position. The transmitter used p.p. 4-250As, an NC-183-DT received, and antennas included 10-, 15-, 20-meter rotaries, a 7-Mc. ground-plane and a 3.5-Mc. doubler.

Next was wily contest enthusiast W4KFC who sent 516 serial numbers and multiplied by 243 to collect 375,921 points. Vic's big sig emanated from p.p. 4-250As at one gallon and a BC-348 plus converter did the inhaling. Attached to that gear were such skywires as a 3.5-Mc. dipole, a 7-Mc. ground-plane, 2-element rotaries for 14 and 21 Mc., and a 20-meter beam fixed at Europe.

Other lofty single-operator totals: K2EDL 346,764, W2WZ 305,916, W4CEN 296,340, W8FGX 244,338, W6GAL 7 235,875, W3JTC 235,584, W3BVN 231,066, W4HQN 209,760, W3ALB 207,888, W3GRF 206,124, W1TYQ 205,946, W1NMP 204,450, W2JT 200,025, W3GHS 183,483, W3HEC 178,190, W4KRR 4 178,002, W9IOP 172,044, W2AGW 170,786, W3VKD 164,010, W9LNM 159,750, VE3ZW 153,546, W9VUL 152,160, W8ACE 149,745, W4ECI 148,716, W6FSJ 148,296, W6RW 148,257, W6TSD 144,207, W2GGL 128,652, W0DAE 126,582, W4DQH 124,124, W9FJB 123,432, W6DZZ 123,414, W3KT 121,410, W3EQA 120,393, W3KDP 117,384, W9HUZ 115,092, W1BOD 112,185, W6WB 111,612, W3JTK 110,592, W1AZY 105,984, VE4RO 105,774, W9GRV 104,490.

The following were topflight multi-operator scorers: W2SAI 357,280, W3EIV 3 294,903, W6TT 257,826, W6AM 241,829, W3GHM 214,578, W9AVJ 211,914, W6EEK 176,490, W6YRA 164,934, W6LDD 142,128. See tabulations for calls of contributing operators.

One might as well expect to hear 160 meters saturated with Asians as to have our DX Test occur without the precision fist of KV4AA much in evidence. And sure enough, Dick plowed all spectrum portions to accumulate the sole score

above the half-million mark, a rousing 532,080-pointer. We'd hate to have his QSL problem, what with 2221 successfully consummated W/V/E exchanges and an 80 multiplier. The r.f. generators included p.p. 4D22s at 200 watts for 1.8 Mc., and p.p. 4-125As for service elsewhere. Dick listened on a 75A-3.

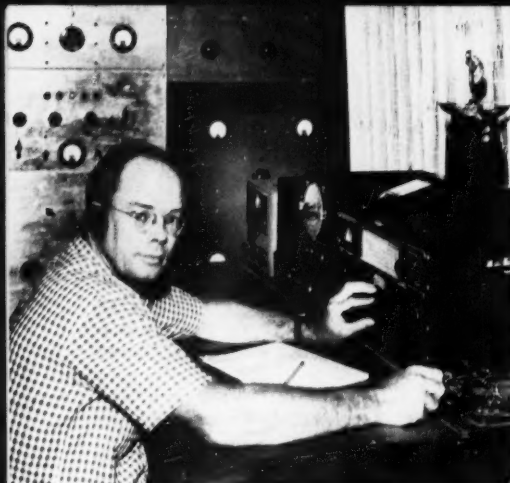
A contact total of 1903 and multiplier of 84 netted KH6IJ 479,556 points and credit for the second-highest overseas tally. Utilizing a host of rhombics and 4-element rotaries directed at North America, Katashi proved again that he is to be reckoned with in any operating activity. He was not without local competition, though; KH6MG checked in with 1879 stations worked and a 76 multiplier for 428,108 points all told.

Other outstanding foreign scores: VP7NM 273,137, KH6PM 221,697, LU3EX 183,570, VP9BF 183,330, TI2TG 182,784, VP3YG 179,630, XE2OK 164,580, KZ5CI 161,880, KH6AYG 145,636, LU8AE 136,743, ZL1BY 133,680, HK4DP 118,088, KG4AT 106,218, XE1SA 103,974, KH6ANK 102,237, VK2GW 101,660, KP4KD 100,998, EL2X 100,980, PY1ADA 98,650, PY1TD 92,976, KL7AWB 92,790, ZL2GS 88,752, ZL1MQ 75,405.

The fact that openings to W/V/E were extremely scarce on any band failed to discourage the following top-scoring Asiatics: JA3AF 29,062, JA3AB 22,500, TA3AA 18,900, K8SC 14,976, KR6AA 14,364, JA1CR 14,256, OD5AX 10,820. Pacesetters in Africa were EL2X 100,980, CR6AI 67,464, KT1UX 54,648, EA8BF 51,060, OQ5GU 40,698, ZS6FN 32,256, EA9AP 31,031, FA9RZ 29,601. Cramped by the dearth of QSOs on 10, 11 and 15 meters, multipliers of European entrants were down, but these continental highs were recorded: F7SHP (multi-op.) 69,432, EA4CH 61,344, OK1MB 61,295, G5RI 60,840, EA1AB 56,736, PA0EP 45,030, G4CP 39,153.



Al Gennaro, W3NOH, operator at W3CTJ.



George Sinclair, W6GAL/7, a believer in fast hand-hopping, finds himself the recipient of two certificates, one for leading the Southern California DX Club c.w. ops and another for Arizona. George was high for the W7 licensing area and twelfth nationally.

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Next in the tonsil tussle was the multiple-operator score of W2SKE 2: 261,775 points, 175 multiplier, 513 stations worked. W2SKE and W2HJR kept at the mike for the full 96 hours, counted on their combined skill, a KW-1, and lots of rotaries and Vee beams to do the job.

Jerry, W3BES, who handles a mike just as well as a key, heard 456 stations reply and had a 148 multiplier for 202,168 points — only remaining 'phone score over 200 grand.

These also exercised modulators and vocal cords to good avail: W4KWY 153,990, W2WZ 135,399, W6YY 124,830, W3VKD 112,176, W4DQH 105,480, W9JIP 85,215, W3GHS 80,444, W8NXF 77,168, W9VUL 75,537, W6PWR 64,326, W4OM 62,208, W9EWC 61,166, W1JEL 55,860, W4NBV 49,728, W8VDJ 46,920, VE4RO 43,945, W8LKH 41,310, W1ZD 34,861, W3EQA 32,956, W5KBP 31,302. And let's not forget these fine multi-operator totals: W2SAI 126,720, W4HQN 122,400, W6YRA 107,415, W9AVJ 96,291, W3CUB 74,340, W8NGO 67,098, W3IMV 50,235, W3JNQ 35,550.

Here's one for the books! Our three leading overseas 'phones dwell in the land of the pineapple and the lei. KH6LJ's 1006 W/VE contacts, 58 multiplier, and 175,044 points paced the group, with KH6MG's 143,134-pointer close behind. Seven participants at KH6AWM grabbed show position with their multiple-operator score of 142,782 markers.

Other big A3 totals besides the above: HP3FL 100,296, KL7AON 70,431, KP4YC 63,916, PJ2AF 41,344, LU1EQ 40,618, KH6AYG 33,984, KH6PM 33,480, VP3YG 33,090, ZS6DW 31,980, HH3RC 22,638, YN4CB 22,437, KG4AT 22,152, XE1OE 18,678, G2PU 17,733, CS3AC 16,560,

### 'Phone Highlights

Chad Knowlton, WIATE — a man who needs no introduction to the contest habitué — stepped 'way ahead of the field among W/VE exponents of the spoken word, chalked up 539 contacts in 185 band-countries for 299,145 points. Active 94 hours, he took time off only to climb a tower and "unstuck" a frozen beam rotator after an ice storm. Chad's corking performance has been topped only once previously — by W2SAI's 313,200 points back in good old '49. The lash-up at WIATE included p.p. 250THs at a kw., a Viking for 160, and two Collins receivers. Chad describes his antenna system in these words: "For 160: a 750-foot long-wire. For 75: a switchable 3-element wire vertical consisting of 2 folded dipoles and 2 reflectors common to either dipole; by energizing either dipole the directivity can be reversed. For 40: a 2-element rotary 112 feet high. For 20: a 3-element wide-spaced rotary and a 6-element Sterba curtain directed east and west. For 15: a 3-element wide-spaced rotary 110 feet up. For 10/11: a 3-element rotary." Any questions as to why WIATE gets out?

### CLUB SCORES

Club	Score	C.W. Winner	'Phone Winner
Frankford Radio Club	22,411	W3CTJ	W3BES
Potomac Valley Radio Club	2,370,687	W4RJC	W3JRF
Southern California DX Club	2,283,469	W6GAL/7	W6YY
Northern California DX Club	1,422,285	W6DZZ	W6PWR
Maul Amateur Radio Club	929,601	KH6MG	KH6MG
Ohio Valley Amateur Radio Assn.	676,893	W8FGX	W8HTT
The DX Club	456,803	W3GHS	
North Suburban Radio Club	348,217	W9EJB	W9GRV
Northwest Amateur Radio Club	347,892	W9XCT	
El-Ray Amateur Radio Club	222,354	W1BOD	
Connecticut Wireless Assn.	198,427	W1TX	
Rochester DX Assn.	162,324	W2SAW	W2MA
Levittown Amateur Radio Club	106,068	W2RDK	
Tri-County Radio Assn.	97,053	W2JME	
Central Connecticut Contest Club	91,089	W1ZDP	
Morris Radio Club	81,312	W2YTH	
Milwaukee Radio Amateurs' Club	74,930	W9GHL	W9GHL
Westpark Radlops	68,576	W8HFE	W8AJW
Ridgewood Amateur Radio Club	65,460		
Tri-City Amateur Radio Club	63,417		
Pottstown Amateur Radio Assn.	51,051		
South Jersey Radio Assn.	17,960	W2SDB	
Canton Amateur Radio Club	7000	W8PEN	
St. Louis University Amateur Radio Club	6388	W8OAW	
Browning School Amateur Radio Club	1773		W9MGT



Los Angeles 'phone winner John Knight, jr., W6YY, finished up with a fancy 124,830 points to rank first on the West Coast, sixth in the U. S. A.

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CO2BM 16,458, DL4TA 14,516, XE2W 12,640, KH6AXH 12,540, XE1QB 12,462, CR6BN 12,098, PY4KL 10,773, EA4DR 10,440, EI9A 9378, VP1GG 9062, XE1TR 8717, PY6BN 8520, PY1AQT 8424, ZL1MQ 8225, EI5I 7875, PY3AGP 7860, LU8DB 7500, ZB2A 7456, DL4XO 7218, HCQD 7106, CO2GO 6817, EA4DL 6783, CTISQ 6575, F7CZ 6454, KP4KD 6048, KL7AWB 6000, HR1FM 5940, TA3AA 5424, OQ0DZ 5040, PJ2AB 5040.

### Club Scores

Bettering the 1953 combined score of its members by a million points, the Frankford Radio Club boosted its aggregate total to 3,133,031 and will shortly receive the handsome gavel that goes to the leading club. This makes it four DX Tests in a row for FRC! Thirty-two certificate winners in the 25 competing clubs are listed in the accompanying box of aggregate scores.

### Sidelights

Regardless of your *modus operandi*, chances are you did your best work on 14 Mc. W3CJT's chubbly code log shows these 102 countries worked there: CE CN8 CO CR5 (Port. Guinea) CR6 CR7 CT1 CX DL DU EA EA6 EA8 EA9 (Sp. Morocco and Rio de Oro) EA0 EI EL ET2 F FA FF8 FM7 FP8 FQ8 G GC GD GI GM GW HA HB HC HH HK HP HR HZ II (Italy and Trieste) IS1 JA KG4 KH6 KL7 KP4 KR6 KT1 KV4 KX6 KZ5 LA LB (Jan Mayen) LU (Argentina and South Orkney) LZ OA OD5 OH OK ON4 OQ OZ PA0 PJ2 PY SM SU SV (Greece) TA TF TG TI VP2 (Leeward) VP3 VP4 VP5 (Cayman) VP6 VP7 VP9 VQ2 VQ3 VQ4 VQ8 VQ9 (Aden) YE YI YO YU YV ZB1 ZB2 ZC4 ZD4 ZE ZP ZS ZS3 ZS7 4X4 5A and 984. Switching to 'phone, we find WIATE with 84 countries on 20: CE CN8 CO CP CS3 CT1 CT3 CX EA EA8 EA9 (Sp. Morocco and Rio de Oro) EI EL F FA FF8 G GC GD GI GM GW HB HC HH HI HK HP HR HZ II (Italy and Trieste) IS1 KA KG4 KH6 KL7 KP4 KR6 KT1 KV4 KZ5 LU LX OA OE13 OH OK ON4 OQ OZ PA0 PJ2 PY SM ST TA VK VP1 VP2 (Leeward and Windward) VP3 VP4 VP5 (Jamaica) VP6 VP9 VQ2 VQ3 VQ4 VQ5 XE YN YV ZB2 ZE ZL ZP ZS 4X4 5A 984. . . . East Bay 'phone leader W6PWR says the only thing that keeps him in California is the weather — this after hearing "all that juicy stuff" coming back to a certain W1. Among his 302 QSOs, though, he lists FORAD, KA0IJ, KC6AG, 3 VS2s and oodles more in Oceania and Asia. . . . The A1 contingent in W6-land also tied onto prefixes easterners didn't whiff. The W6TT group, for example, landed UA0KFA, VK1AC, VK9YY, VR3D, VS1FE, 3 VS6s and ZL1BG, to mention a few. . . . Lowest-powered station worked at VP6AF was 95-watt W5DQV and a new state. . . . If you're on the DXCC Honor Roll or approaching same, this paragraph is not for you. You already know what follows or you wouldn't be where you are. These hints ofttimes explain reasons for

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Asia leader Ichiro Sakurai, JA3AF, ran one kw. on 7-14-21-28 Mc. and 700 watts on 3.5 Mc. to a long wire and a zepp to take c.w. honors for Japan.

## October 1954



changed scores. Check your log after perusing; mayhap you unwittingly worked a new country. (1) VP5BH was Cayman; other VP5s reported active were Jamaicans. (2) All 'L' calls with the letter "Z" after the digit are separate from Argentina. LU6ZE and LU7ZE count as Antarctica. LU7ZM as South Orkneys. (3) All VKs were in Australia with the following exceptions: VK1AC was Macquarie Island; VK9RH, Norfolk Island; VK9YY New Guinea. (4) IT1 calls are same as Italy. Its BNU YAK and YCV, however, are in Trieste. Similarly, Sicilian IS1AHK is a bona fide country multiplier. (5) The Leewards were represented by VP2s AD KB MD, the Windwards by VP2s DL DN GX SE SH. (6) Maritime mobiles cannot be counted either as contacts or multipliers. (7) All OQs go for Belgian Congo. (8) VP8s AK and AW are South Shetlands. . . . From the June issue of the Egyptian Radio Club's *Podunk News*: "PERSONAL — Daddy, the DX Contest is over and all is forgiven. Please come out of the basement — Mother and the Children." . . . DXers on the move: W6IBD, L. A. multi-op winner in '53, showed up as K2EDL with the country's fifth-ranking c.w. score (did Frankford Radio Club meet him at the plane?). Last year's world-high scorer K4IAF, now W4BQY, has to compete with the likes of W4HQN, W4KEC, W4KWW, etc., for section honors — what a place to settle down! PVRC mainstay W3MSK operated KX6BU at Kwajalein to give code men the Marshalls on 3.5-7-14 Mc. Both ST2AR and ZE3JP pounded brass merrily the first week end, but had returned to the U.K. by the time the second one rolled around. . . . KL7BAK got his license on March 25th, just in time for c.w. Section 2, regrets he missed February. . . . The number of disqualifications reached the lowest point ever. The following are deemed ineligible for contest listings or



awards because of off-frequency operation as confirmed by a single FCC citation or two ARRL Official Observer measurements. C.W. — KH6AGX/KG6. Phone — W3GHI. . . . Check logs were submitted by these noncompeting amateurs. C.W. — W1s BB CFS DHO, W2s FMP ICO NOY, K2s CIU EVH, W3s AYS HDV VD VK, W4s GQL LYY NMK/4, W5s AD DML RX, W6s AAE EFR OAW PQL WNX WPI, W7EYR, W8s ANO MFI WWU, W9s MDG VEC. VE3s AXL XY, VE7AKH, HB9s KB6BA, KP4UE, SM5BBX, VE3ZHR, VK4LZ, ZL2LB. Phone — W1s APA NWO, W2s EB FMT, W3AEV, W4s GIO VMT, W5s LWG NNF, W6s FID ZOL, W7s BBK EYR, W8PCS, VE5VZ, F9ZQ, KL7RZ, SM5s ARL BBX, ZL1HY. . . . *Muchas gracias por todo* to URE's EA4CM for gathering and forwarding reports from numerous EAs, and to EA4DO for circulating his Spanish language propagation forecast covering the contest periods. Thanks, too, to DL9PJ for his pamphlet summarizing the rules in German. . . . Most popular final amp overseas is still the 807. With just 10 watts to theirs, JA6AA made 91 and VP6AF, 140 W/VE QSOs. Other users, all running between 20 and 50 watts to the ubiquitous valve: EA8BF, EA8BK, F8TQ, FK8AO, HB9MU, KP4RK, LA7FD, OH3QB, PA0XD, PJ2CE, ST2AR, VP3YG, VP4LW, XE1OE, ZE2JS, ZE3JJ, ZE5JA. And there were seeds more. . . . Reports on additional low-power entries indicate FP8AP and HZ1HZ at 25, JZ9KF at 30, and LA6U at 35 watts input. . . . The W6AM combo swapped six-figure serial numbers with KH6IJ and KH6MG on seven bands, also delighted ZL1MQ by providing his first 160-meter U.S.A. contact. . . . W4ZZ lays claim to the oldest rig in the contest: p.p. 1X 210s, built in the thirties. . . . Some of the hallowed few who pushed through to us on 28 Mc., despite the uncooperative ether: C.W. — HK4DP, KH6s AYG IJ MG PM, KP4KD, KV4AA, KZ5CL, LU's IEP 3EX 8AE, VP7NM, XE's ISA 2OK, YN1AA, ZL1BY. Phone — HP3FL, HR1AA, KZ5BD, LU's IDEB 8DB, XE1QB. Prefixes such as CX, HC and PJ were also in there for a spell. To work the U. S. A. on 10 a station obviously had to be south,



Nineteen hours' worth of patient chipping at the pile-ups brought Señor Adolfo Perez Real, EA9AP, 31,031 points and the eternal good will of W/VE brasspounders needing Spanish Morocco. Adolfo is always good for a QSL, too!

and the farther the better. . . . W1CTW wishes 15 meters would stay as peppy as it was in March. . . . A 14-Mc. A3 QSO with XZ2KN understandably rated four exclamation points on a W2SKE/2 log sheet. . . . PH1LS, allegedly (1) Azores, (2) Netherlands West Indies, (3) Netherlands, and (4) "You tell me," was actually the Dutch vessel *Cirrus*. Position was 45° N., 16° W., which plots slightly west of the Bay of Biscay. . . . Sorting the boys from the 7-Mc. QRM was a chore, averse brasspounder ZL3OP but, with schemes afoot for doubling his score, he already has his request in for '55 contest forms. . . . DU7SV has QSLd all stations worked (both modes) with QTHs in the

1952 Winter Call Book. Try again if you weren't listed in that issue. . . . VS6CG's log displays 98 U.S.A. c.w. contacts — 97 W6s and W7s and W3CRA, Frank, ex-W8CRA and holder of the very first DXCC award issued, apparently pipes a rock-crushing signal into the Far East. . . . W6LWY had a hard time figuring out GCT. It may have been our fault as some date errors sneaked into the contest announcement. Sorry. . . . KL7AON calls attention to peculiar conditions the second Saturday when he talked to VE6YZ and VESGY on 40-20-15-11-10 in less than an hour. . . . Typical multipliers of stations outside W/VE: from 15 to 17 out of a possible 19. Most missed were VE8 and VO, with VE5 and VE6 next toughest. . . . W0YCR gave our newest band a whirl and is now a 21-Mc. convert. . . . These incorrect calls, the result of "code copy errors," were spotted in W logs: AI8FBH, DZ3BC, EI1BNU, FQ8IF, KP4TAD, LU6BE, VP2OI. How many can you decipher? . . . W2SAW says the bands were hot, believes the sunspot theory should be relegated to the ash heap. . . . In the "Don't we all?" department, W6HPB deplores these practices by c.w. entrants: (1) "CQ DX" by the U. S., "dah-dah-dah" group, (2) long calls on the frequency of DX, (3) use of rigs that must be completely retuned when the frequency is shifted 10 kc. or more. . . . Trials and tribulations: at W6NZW the transmitter conked out the first week end, his receiver the second. . . . WH1QN would like to see an "age" multiplier of 1.5 for ops over fifty. . . . W6BAX's weeds got three feet high during February and March. . . . Apologizing for his "not very imposing" score, W0TKX explains "the instruments I use are not designed for drawing blood, at least at a distance." The "instruments" were potted 6146s at 100 watts. . . . Now that he got his feet wet in his first contest, W2QZL worries about the fun he's passed up in 20 years of hamming. . . . A QSO with new one FM7WP in the closing minutes made c.w.-er W3RFA really happy. . . . Biggest U. S. A1 tally with no rotary was W3BVN's 231,066-pointer, but Lyt had some fancy arrays, viz.: reversible 2- and 4-element fixed beams for 40, and two reversible 4-element fixed beams for 20 meters. . . . W6YY liked the savvy operating exhibited by the foreign "phone boys. . . . W4CYA is positive conditions were better this time but feels he needed (1) a bit more power, (2) some additional receiver selectivity, (3) rotaries for 14, 21 and 28 Mc., and (4) more operating time. . . . SM5ANY, Sweden code winner, got six new states. . . . W6ZUI thanks an atomic explosion for better conditions in March. *Quien sabe?*

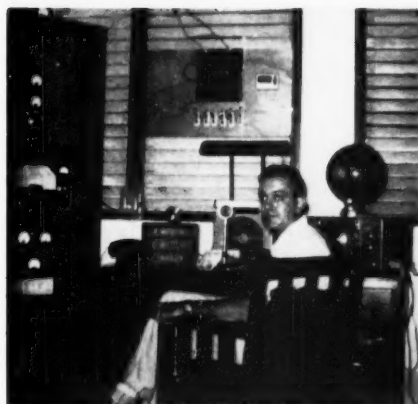
## C. W. SCORES

### Twentieth International DX Competition

Operator of the station first-listed in each section and country is winner for that area. . . . The multiplier used by each station in determining score is given with the score — in the case of U. S.-Canada this is the total of the countries worked on each frequency-band used; in the case of non-W/VE/YVO entries it is the total of the U. S.-Canada districts worked on each band. . . . The total number of contacts is listed next. . . . The letters A, B, and C approximate the input to the final stage at each station; A indicates power up to and including 100 watts; B indicates over 100 watts, up to and including 500 watts; C indicates over 500 watts. . . . The total operating time to the nearest hour is given for each station and is the last figure following the score. . . . Example of listings: W3CTJ 452-394-246-613-C-86, or final score 452,394; multiplier 246; 613 contacts; power over 500 watts; total operating time 86 hours. . . . Stations manned by more than one operator are grouped in order of score following single-operator listings in each section or country tabulation; calls of participants at multi-operator stations are listed in parentheses. . . . Where three or more multiple-operator entries appear, the top-scoring station is being awarded a certificate.

### ATLANTIC DIVISION

ATLANTIC DIVISION		W3D1R	37 638-	82-123-C-47
Eastern Pennsylvania		W3HER	36 729-	77-159-B-30
W3CTP	452 394-246-613-C-86	W3JHH	22 506-	62-121-C-
W3RFS	431 244-242-594-C-90	W3GHD	19 296-	67-96-B-
W3ALB	207 888-183-379-C-75	W3CJR	19 116-	59-108-C-17
W3GHS	183 483-171-358-B-59	W3RFS	18 244-	242-594-C-90
W3KTY	121 410-142-284-C-	W3ALB	207 888-	183-379-C-75
W3EQA	120 393-147-273-C-65	W3GHS	183 483-	171-358-B-59
W3ADZ	69 324-106-218-C-44	W3KTY	121 410-	142-284-C-
W3LIZ	51 500-103-167-C-42	W3EQA	120 393-	147-273-C-65
W3KFK	40 425-77-175-C-36	W3ADZ	69 324-	106-218-C-44
		W3LIZ	51 500-	103-167-C-42
		W3KFK	40 425-	77-175-C-36
		W3JW	37 638-	82-123-C-47
		W3HER	36 729-	77-159-B-30
		W3JHH	22 506-	62-121-C-
		W3GHD	19 296-	67-96-B-
		W3CJR	19 116-	59-108-C-17
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		W3ALB	207 888-	183-379-C-75
		W3GHS	183 483-	171-358-B-59
		W3KTY	121 410-	142-284-C-
		W3EQA	120 393-	147-273-C-65
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		W3GHD	19 296-	67-96-B-
		W3CJR	19 116-	59-108-C-17
		W3RFS	18 244-	242-594-C-90
		W3ALB	207 888-	183-379-C-75
		W3GHS	183 483-	171-358-B-59
		W3KTY	121 410-	142-284-C-
		W3EQA	120 393-	147-273-C-65
		W3ADZ	69 324-	106-218-C-44
		W3LIZ	51 500-	103-167-C-42
		W3KFK	40 425-	77-175-C-36
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		W3HER	36 729-	77-159-B-30
		W3JHH	22 506-	62-121-C-
		W3GHD	19 296-	67-96-B-
		W3CJR	19 116-	59-108-C-17
		W3RFS	18 244-	242-594-C-90
		W3ALB	207 888-	183-379-C-75
		W3GHS	183 483-	171-358-B-59
		W3KTY	121 410-	142-284-C-
		W3EQA	120 393-	147-273-C-65
		W3ADZ	69 324-	106-218-C-44
		W3LIZ	51 500-	103-167-C-42
		W3KFK	40 425-	77-175-C-36
		W3JW	37 638-	82-123-C-47
		W3HER	36 729-	77-159-B-30
		W3JHH	22 506-	62-121-C-
		W3GHD	19 296-	67-96-B-
		W3CJR	19 116-	59-108-C-17
		W3RFS	18 244-	242-594-C-90
		W3ALB	207 888-	183-379-C-75
		W3GHS	183 483-	171-358-B-59
		W3KTY	121 410-	142-284-C-
		W3EQA	120 393-	147-273-C-65
		W3ADZ	69 324-	106-218-C-44
		W3LIZ	51 500-	103-167-C-42
		W3KFK	40 425-	77-175-C-36
		W3JW	37 638-	82-123-C-47
		W3HER	36 729-	77-159-B-30
		W3JHH	22 506-	62-121-C-
		W3GHD	19 29	



Producer of the fourth-position 'phone total from outside W4VE was Frank Linares, HP3FL. Frank worked all hands from 75 through 10, even made 13 QSOs on 11 meters. The gear included p.p. 813s at 350 watts, an HRO, and two rhombics.

W3SOH 243- 9- 9-B-  
W3GDM (W3S GHM LVE)  
214,578-183-393-C-70  
W3IMV (W3S BIP IMV)  
95,976-129-248-B-68  
W3CGS (W3S CGS GHM)  
49,995-101-165-C-45

#### *Mid-Ind-I.C.*

W3JTC 235,584-192-409-C-82  
W3HYN 231,066-198-389-C-70  
W3GRF 206,124-193-356-C-84  
W3HFC 178,190-173-344-C-74  
W3KIDP 117,384-146-268-C-4  
W3JTK 110,592-144-256-C-60  
W3ELS 91,977-129-238-B-52  
W3AOD 66,600-111-209-B-31  
W3DRD 57,477-119-161-C-45  
W3MEJ 48,195- 85-180-C-4  
W3AEL 25,986- 71-122-B-6  
W3DVO 25,560- 71-120-C-45  
W3COK 12,886- 58- 73-C-32  
W3CPR 4257- 33- 43-B-17  
W3RFA 399- 35- 38-A-  
W3EPR 3813- 31- 41-B-16  
W3RNY 3444- 28- 41-C-29  
W3WV 2604- 28- 31-B-10  
W3EER 2430- 27- 30-B-6  
W3TDG 861- 16- 18-B- 7  
W3VIR 686- 12- 13-B-6  
W3EIV/3 (W3S EFZ EIV W4S  
DWU YKO)  
294,903-217-453-C-96  
W3ZQ (W3ZQ W4NS)  
84,120-120-234-C-70  
W3MSK (W3S LKN MC)  
54,708-97-188-C-48

#### *Southern New Jersey*

K2EDL 346,764-222-521-C-86  
W2GGI 128,652-151-284-C-65  
W2SJR 16,184- 52-1094-C-31  
W2QJQ 14,176- 47-103-B-23  
W2CAG 1296- 18- 24-B-9  
W2VIM 1215- 15- 27-B-9  
K2CH 1200- 16- 26-B-8  
W2LS 429- 11- 13-A- 7  
W2HAZ 272- 8- 12-A- 3  
W2DAJ 168- 7- 8-B- 2  
K2AJD 12- 2- 2-A- 1  
W2SAI (W2SAI K2C PIC)  
357,280-224-533-C-78

*Western New York*  
W2UWD 63,558-107-198-C-60  
W2SAW 62,109-103-201-B-60  
W2FBA 28,728- 76-126-B-22  
W2RHH 27,432- 72-127-B-54  
W2AIM 18,200- 52-117-C-25  
W2QJM 16,245- 57- 95-B-30  
W2DOD 13,311- 51- 87-B-21  
W2MA 7560- 45- 56-C-20  
W2NTE 6549- 37- 54-C-30  
W2TYS 1701- 21- 27-C- 7  
W2QZL 1140- 19- 20-B-12  
W2FEV 48- 4- 4-B- 4  
W2ZCZ 3- 1- 1-A- 1  
W2UTH (W2S DJW UTH)  
2448- 21- 34-B-18

#### *Western Pennsylvania*

W3VKD 164,010-154-355-C-58  
W3LPE 42,315- 91-155-B-72  
W3DNN 17,986- 56-107-B-3  
W3APQ 7803- 51- 51-A-52  
W3SLJ 90- 5-18-A-25

#### **CENTRAL DIVISION**

*Illinois*  
W9FJR 123,432-139-296-C-72  
W9HIZ 113,092-138-278-B-70  
W9GRV 104,490-135-358-C-80  
W9VIN 51,424- 91-188-C-48  
W9HID 44,319- 79-187-C-49  
W9TR 40,425- 77-175-C-  
W9AFA 40,320- 84-160-C-  
W9NTH 38,442- 86-1494-C-47  
W9ERU 27,600- 80-115-C-30  
W9PNE 27,521- 73-127-B-41  
W9ATZ 23,166- 66-177-C-28  
W9WKE 19,494- 57-114-C-40  
W9QJY 14,520- 55- 88-C-12  
W9QDI 13,126- 47- 86-B-46  
W9TIC 9501- 48- 66-B-17  
W6PMI/0 5772- 37- 52-C-38  
W9RMH 5499- 39- 47-B-8  
W9WJV 4230- 30- 47-B-17  
W9VTV 2833- 21- 45-C-12  
W9WIO 1500- 20- 25-B-10  
W9WYB 1440- 16- 30-A-17  
W9VSN 1134- 18- 21-A-24  
W9DRU 1035- 15- 23-B-14  
W9SCR 960- 16- 20-B-30

W9RLD 925- 16- 20-B- 8  
W9DDP 750- 12- 21-B- 5  
W9WQE 351- 9- 13-A- 6  
W9NSI 297- 9- 11-A- 3  
W9LTA 710- 7- 10-B- 6  
W9DQV 180- 5- 12-A-16  
W9GNG 12- 2- 2-B- 1  
W9AVJ (W9S LHS GVZ NZM  
PKW) 211,914-183-386-C-36

*Indiana*  
W9IOP 172,041-162-354-C-80  
W9VUL 152,160-160-317-C-50  
W9JIP 96,558-117-258-C-76  
W9URK 25,840- 68-128-B-68  
W9JFR 20,280- 65-106-B-65  
W9UC 960- 16- 20-B- 7  
W9FYM 180- 6- 10-B- 5  
W9DGA 90- 5- 6-B- 1

*Wisconsin*  
W9LNM 159,750-150-355-C-75  
W9GIL 61,200-102-200-C-  
W9RQM 55,836- 94-198-C-29  
W9GWR 18,480- 55-112-B-30  
W9HIN 10,032- 38- 88-B-20  
W9RRP 7839- 39- 67-B-33  
W9KXK 2079- 21- 33-A- 8  
W9SRZ 1761- 21- 28-B-42  
W9FDX 1425- 19- 25-B-6  
W9VOD 1104- 16- 23-A- 5  
W9UDK 407- 11- 13-B-41  
W9HUM 147- 2- 3-  
W9WVJ 126- 6- 7-B- 1  
W9WAN 3- 1- 1-A- 1

#### **DAKOTA DIVISION**

*North Dakota*  
W0EOZ 3525- 25- 47-B-10

*South Dakota*  
W0BLZ 29,820- 71-140-B-30  
W0LDE 16,059- 53-101-C-30

*Minnesota*  
W0AII 53,934- 89-202-C-32  
W0JNS 29,110- 71-137-B-45  
W0MPW 26,040- 70-124-C-53  
W0QBA 16,530- 55-102-B-35  
W0YCR 13,524- 49- 92-B-  
W0NLY 10,260- 45- 76-C- 7  
W0TRN 9672- 41- 71-A-17  
W0VIP 1071- 17- 21-B-  
W0KRG 510- 10- 17-B- 9

#### **DELTA DIVISION**

*Arkansas*  
W5QKZ 4725- 35- 45-B-  
W5MSH 75- 5- 5-B- 2

*Louisiana*  
W5KFC 36,261- 79-153-A-30  
W5CLW 23,958- 66-121-C-  
W5FTB 855- 15- 19-B-6

*Mississippi*  
W5CKY 74,052-121-204-C-31  
K5FBR (W5AZL MFC W6-  
K1Q K6DRA)  
27,690- 71-130-B-81

*Tennessee*  
W4DQH 124,124-143-290-C-60  
W4NRY 34,190- 77-1484-C-60  
W4FRA 19,902- 62-107-B-42  
W4ZZ 6273- 41- 51-A-42  
W4OGG 90- 5- 6-A- 1

#### **GREAT LAKES DIVISION**

*Kentucky*  
W4KVN 47,223- 99-159-C-22  
W4EPA 73,117-B-48  
W4JHQ 2341- 24- 30-B-18  
W4OMW 2457- 27- 31-B-19

*Michigan*  
W8CVU 81,840-124-220-B-45  
W8YIN 52,734- 94-187-A-40  
W8JHS 90,148-124-243-B-56  
W8HAY 1944- 22- 29-A-27  
W8DLZ 1782- 22- 27-B-10  
W8ROV 473- 11- 15-C-10  
W8SS 168- 7- 8-B- 5  
W8MCC 3- 1- 1-B- 1

*Ohio*  
W8FGX 244,338-193-422-C-75  
W8ACV 149,745-149-334-C-53  
W8ZJM 90,148-124-243-B-56  
W8EV 89,556-128-234-C-54  
W8LKH 82,584-124-233-C-39  
W8YHO 40,545- 85-159-B-46  
W8PIT 35,366- 72-155-C-  
W8RTT 21,219- 69-117-C-20  
W8HFE 22,692- 62-122-C-12  
W8DMD 21,240- 60-118-C-4  
W8ROJ 17,484- 62- 94-C-13  
W8AJW 14,630- 55- 89-A-  
W8PSS 5814- 34- 57-B-18  
W8NJE 11,628- 51- 76-B-  
W8RG 8414- 34- 57-B-18  
W8PWN 44,555- 33- 45-C-17  
W8JG 3672- 27- 46-B-18  
W8RC 2592- 24- 36-B-13  
W8HJQ 2040- 20- 34-A-20  
W8RUM 1827- 21- 29-B-12  
W8NP 1729- 19- 31-C-10  
W8PM 1539- 19- 27-B-  
W8DAE 1404- 18- 26-A-8  
W8FEM 1235- 19- 22-A-14  
W8KMF 816- 16- 17-B-10  
W8PSS 1098- 14- 24-C-14  
W8VZL 168- 7- 8-B- 6

#### **HUDSON DIVISION**

*Eastern New York*  
W2HJ 70,512-104-226-B-43  
W2LWD 56,454- 97-194-C-62  
W2AWI 46,440- 86-180-C-49  
W2HPS 22,692- 62-122-B-22  
W2JRV 13,959- 47- 90-A-14  
W2MHE 9576- 42- 76-B-21  
W2VCR 7668- 36- 71-B-19  
W2JFM 7650- 34- 75-B-29  
W2HRI 1098- 14- 24-C-14  
W2NJE 144- 6- 8-B- 1  
W2APH 12- 2- 2-B-6

#### *N.Y.C.-L.I.*

W2WZ 305,916-212-481-C-76  
W2HRY 62,496- 96-218-B-57  
W2WC 49,350- 94-175-B-48  
W2GNS 47,624- 74-192-C-  
W2RPK 35,511- 89-1334-C-60  
W2PEN 25,545- 65-131-B-28  
W2ESB 22,950- 75-102-B-25  
W2MUM 20,160- 60-112-B-62  
K2 L 18,180- 60-101-B-  
W2HRY 11,400- 56- 76-B-33  
W2KTF 87,36- 61-B-13  
W2QMO 4968- 36- 46-B-23  
W2GTL 4725- 35- 45-B-10  
W2FCQ 3840- 32- 40-B-20  
W2NTO 3690- 30- 41-A-30  
W2GFF 2925- 25- 39-A-14  
W2HJ 2592- 24- 36-B-11  
W2PCT 1728- 16- 36-A-15  
K2DGT 1377- 17- 27-B-35  
W2DPL 1173- 17- 23-A-20  
W2HJ 840- 14- 20-B- 8  
W2KCN 330- 10- 11-B- 6  
W2HXA 192- 8- 8-B-12

Consistent S. R. Kharbanda, holder of the famed contest call G2PU, has won England's 'phone award in all eight postwar DX Competitions. Last year's mused on how come G2PU is oftentimes the sole European signal on the band, the 20-meter skyhook is a 14-element array 75 feet high!



W1UCH/2 108- 6- 6-B-  
W2RGT 36- 4- 3-B- 2  
K2DCJ 27- 3- 3-A-  
W2NHH 3- 1- 1-A-  
W2AZB (W2S AZS ZN) 43,344- 84-172-C-30

#### Northern New Jersey

W2JIT 200,025-175-381-C-37  
W2AGW 170,786-154-370-C-78  
W2YTH 78,948-108-215-B-53  
W2JMH 78,146-117-228-B-56  
W2EAS 62,067-107-194-B-82  
W2ZGJ 52,920- 90-196-B-66  
W2CWK 45,291- 91-167-A-48  
W2TWC 16,663- 55-101-B-19  
W2AVT 16,443- 63- 87-A-44  
W2IWK 13,686- 48- 95-B-48  
W2MNN 8,800- 44- 65-B-21  
W2GKI 4,589- 31- 50-B-22  
W2LSJ 4,402- 31- 48-A-5  
W2IHN 2,232- 21- 31-B-45  
W2JIT 2,160- 18- 40-B-18  
W2CWW 1,001- 13- 26-A-24  
K2GVM 855- 15-19-B-10  
W2TD 546- 13- 14-B-4  
W2NY 390- 11- 12-A-3  
W2KNO 75- 5- 5-B-1  
W2EBV 21- 3- 3-B-1  
W2HEG 3- 1- 1-B-6  
K2RBE 3- 1- 1-A-  
W2QW (K2S EUN GAS) 676- 13-18-A-15

#### MIDWEST DIVISION

##### Iowa

W0FDL 17,358- 66- 88-C-33  
W0CEN 10,800- 40- 90-A-16  
W0QVZ 7,480- 40- 63-B-28  
W0DIB 744- 12- 21-B-6  
W0VFM 36- 3- 4-A-2

##### Kansas

W0DAE 120,582-146-289-C-60  
W0ERI 37,908- 78-162-A-4  
W0VHQ 25,092- 68-124-C-35  
W0H1R 11,952- 48- 83-B-23  
W0B1T 6,765- 41- 55-A-16  
W0QPH 750- 14- 18-A-14  
W0RYN 108- 6- 6-B-9

##### Massachusetts

W0DU 37,908- 81-156-B-48  
W0CVZ 30,600- 75-130-B-33  
W0RNM 822,860- 60-127-C-75  
W0QDF 18,981- 57-111-A-30  
W0DPA 8034- 26-103-B-48  
W0QAW 5040- 30- 56-A-10  
W0AHR 2800- 25- 38-B-70  
W0FTW 1071- 17- 21-A-20  
W0EZX (W0S EZX GVI LHY MNV) 7488- 39- 64-A-46  
W0MNY (W0S EDC GVI LHY MNV) 3960- 30- 46-A-40

##### Nebraska

W0AIN 624- 13- 16-B-5  
W0B1R 90- 5- 6-A-4

#### NEW ENGLAND DIVISION

##### Connecticut

W1TYQ 205,946-178-386-C-75  
W1NMP 204,450-174-394-C-78  
W1TN 96,300-126-257-B-39  
W1RHH 71,628- 94-254-C-  
W1AR 68,796-117-196-C-50  
W1DHW 55,200-100-184-B-57  
W1ZMP 37,605- 93-135-B-35  
W1AW 37,224- 88-141-C-  
W1FTN 29,230- 79-125-B-35  
W1DIT 24,360- 70-116-C-23  
W1WDP 15,714- 54- 97-A-20  
W1AJQ 5046- 29- 58-B-18  
W1RST 4320- 32- 45-B-9  
W1APA 4176- 29- 48-C-8  
W1NKR 1800- 20- 30-B-26  
W1TSZ 1323- 21- 21-A-25  
W1NMP 1071- 17- 21-B-2  
W1NML 430- 10- 15-B-8  
W1UHP 240- 8- 10-B-4  
W1WVV 105- 5- 7-A-2  
W1RAN (W1S RAN R) 19,437- 57-115-C-50

##### Maine

W1DLK 89,903-121-252-C-90  
W1HKE 31,500- 70-150-C-40  
W1APU 11,868- 43- 92-B-20

##### Eastern Massachusetts

W1HOD 112,185-135-278-C-58  
W1HYZ 105,984-138-256-B-60  
W1JEL 96,720-130-248-C-60  
W1JEP 75,900-110-230-B-54  
W1PEG 27,366- 68-134-B-45  
W1NXY 26,996- 68-135-B-43  
W1LQQ 7008- 32- 73-A-15

W1AQE 3888- 27- 48-A-  
W1NYA 3677- 25- 49-B-8  
W1AP 1197- 19- 21-B-  
W1CTW 1092- 13- 28-C-20  
W1JSM 1050- 16- 22-A-  
W1HOL 358- 12- 17-C-  
W1WAG 324- 9- 12-A-4  
W1CFJ 216- 6- 12-A-12  
W1WMH 161- 7- 8-A-19  
W1VRI 64- 4- 6-A-8  
W1PLI 48- 4- 4-A-6

#### Western Massachusetts

W1AFW 52,890- 86-205-B-47  
W1WTF 1428- 17- 28-B-15  
W1TVJ 1029- 18- 19-B-15

#### New Hampshire

W1EF 40,581- 80-167-B-  
W1NLI 7524- 33- 76-B-15  
W1ORG 1653- 19- 29-B-9

#### Rhode Island

W1MLJ 36,279- 87-139-B-47  
W1AWE 17,649- 53-111-C-33  
W1WBR 4590- 30- 51-B-21  
W1KIF 1683- 17- 33-B-6  
W1AOP 936- 12- 26-B-11

#### Vermont

W1SPK 3168- 24- 44-B-18  
W1RWP 3072- 32- 32-B-21

#### NORTHWESTERN DIVISION

##### Idaho

W7UDG 8217- 7- 13-A-10

##### Montana

W7CJB 8217- 33- 83-B-24

##### Oregon

W7DAA 35,640- 72-165-C-47  
W7AHN 30,660- 70-146-B-53  
W7G1R 13,506- 44-103-B-41  
W7JLI 10,530- 39- 90-B-24  
W7TMI 7047- 27- 87-A-93  
W7RNY 1131- 13- 29-B-10

##### Washington

W7CEN 42,588- 78-182-B-50  
W7PQI 30,418- 67-152-C-30  
W7DYG 24,960- 64-130-C-46  
W7ELD 15,600- 50-104-C-68  
W7CJ 11,340- 35-108-A-30



The lucky few that raised him will enjoy this shot of Finn Jensen, LBBYB. Nope, Finn didn't run short of blades during the Test... it gets cold in Jan Mayen!

W4MZF 7 9202- 43- 72-B-28  
W7ICD 7 1586- 13- 41-B-15  
W7HAD 870- 10- 29-C-5  
W7IZ 360- 8- 15-B-20  
W7SRX 54- 2- 9-A-20  
W7NRB (W7S CV MEM NRB RT) 12,915- 41-105-B-25

#### PACIFIC DIVISION

##### Nevada

W7KEV 32,631- 73-149-B-31



Lloyd D. McBurney, PJ2AF, with p.p. 807's in Class B modulating an 813, turned in South America's top 'phone tally, placed 5th among overseas 'phone entrants. Lloyd chatted with 412 W/VE contesters on 10, 15 and 20 meters.

#### Santa Clara Valley

W6DZZ 124,414-134-307-C-66  
W6RAX 78,486-109-240-C-  
W6RAX 71,820- 95-252-C-  
W6VDG 71,008-112-212-C-64  
W6R 68,478-101-226-B-54  
W6R 22,092- 62-122-C-29  
W6WLI 13,095- 45- 97-C-30  
W6MN 10,530- 45- 78-C-7  
K6IDC 7712- 32- 81-B-56  
W6WJ 7394- 27- 85-B-38  
K6DV 3- 1- 1-B-1

#### East Bay

W6LW 57,600- 96-200-C-  
W6MVQ 33,117- 83-133-C-18  
W6FLT 20,436- 52-131-B-48  
W6ZU 20,130- 61-110-C-16  
W6VO 19,176- 51-126-C-30  
W6KEK 15,729- 49-107-B-20  
W6LPC 15,180- 46-110-B-36  
W6LT 13,095- 45- 97-C-40  
W6DDE 8436- 37- 76-C-23  
W6PH 4758- 26- 61-B-20  
W6PWR 2531- 21- 37-C-6  
W6LJA 1887- 17- 37-B-8  
W6MHB 1767- 19- 31-B-4  
W6LZN 1734- 17- 34-B-4  
W6LMZ 1056- 16- 22-B-8  
W6LT (W6S PVH T) 57,826-194-443-C-90  
W6LDD (W6S GZ LDD PB RCC) 142,128-114-329-C-84

#### San Francisco

W6WR 111,612-131-284-C-  
W6GPB 77,292-113-228-B-  
W6ATO 76,545-105-243-C-84  
W6RYB 67,515-105-215-C-65  
W6GWQ 29,949- 67-149-B-40  
W6MUF 26,520- 65-136-C-35  
W6GOK 19,152- 56-114-C-30  
W6YC 84- 4- 7-A-1

#### Sacramento Valley

W6WZD 56,070- 89-211-C-45  
W6ONZ 34,488- 72-161-C-54  
W6CIS 15,042- 46-109-B-  
W6TNL 11,700- 39-100-C-32  
W6MCP 5724- 36- 55-C-14  
W6BIL 2448- 24- 34-B-20  
W6AMB 60- 4- 5-B-  
W6VBI 48- 4- 4-B-6

#### San Joaquin Valley

W6KEV 70,374-111-212-C-43  
W6MEL 31,290- 70-149-C-35  
W6HYK 180- 6- 10-A-3

#### ROANOKE DIVISION

##### North Carolina

W4CEN 296,340-220-449-C-70  
W4GNS 59,655- 97-205-C-31  
W4N1 47,259- 99-177-C-51  
W4AIN 46,644- 92-169-C-60  
W4ATC 189- 7- 9-B-  
W4CEN 296,340-220-449-C-70  
W4GNS 59,655- 97-205-C-31  
W4N1 47,259- 99-177-C-51  
W4AIN 46,644- 92-169-C-60  
W4ATC 189- 7- 9-B-

#### Virginia

W4KFC 375,921-243-516-C-86  
W4HQN 209,760-184-380-C-70  
W4RHR 178,002-174-341-C-  
W4HQY 89,652-124-241-C-34  
W4BVX 81,420-118-230-B-76  
W4PSK 38,448- 89-144-B-56  
W4TD 32,576- 76-142-B-45  
W4NH 24,003- 63-127-B-25  
W4QW 22,977- 69-111-B-28  
W4JAT 17,940- 52-115-B-41  
W4OM 13,230- 49- 90-C-  
W4FF 7254- 39- 62-C-12  
W4TOR 2508- 22- 38-B-22  
W4AMZ 2418- 26- 31-B-12  
W4ZJG 2244- 22- 34-B-7  
W4IA 1008- 16- 21-B-10  
W4WBC 432- 12- 12-A-5

#### West Virginia

W5PQJ 51,975-105-165-C-29  
W5HZA 7056- 42- 50-B-19

#### ROCKY MOUNTAIN DIVISION

##### Colorado

W0SBE 33,696- 72-156-C-60  
W0LW 9450- 42- 75-B-30  
W0LWH 6930- 41- 70-B-38  
W0QPO 1581- 17- 31-B-13  
W0RV 408- 8- 17-A-5  
W0JRG (W0S JRG JVA) 13,365- 45- 99-B-60

##### Utah

W7QDJ 13,332- 44-101-A-53

##### Wyoming

W7PSO 1155- 15- 26-B-20

#### SOUTHEASTERN DIVISION

##### Alabama

W4ECT 148,716-153-324-C-76  
W4QCE 2790- 30- 31-B-26

##### Eastern Florida

W4TQA 28,080- 72-130-C-45  
W4TRP 18,034- 71- 96-B-22  
W4WHK 17,085- 67- 85-A-65  
W4LAP 15,120- 60- 84-A-18  
W4DLP 1725- 23- 25-B-11  
W4TK 585- 13- 15-C-7  
W4LEO 126- 6- 7-B-10

##### Western Florida

W4NN 50,508- 92-183-C-48  
W4WKQ 20,475- 65-105-B-50

##### Georgia

W4CEN 20,808- 68-102-B-41  
W4N1 4611- 29- 53-B-18  
W4JH 756- 12- 21-A-22  
W4ZSC 90- 5- 6-A-2

Carl Cleveland, KT1UX, created a stir amongst A1 competitors by singlehandedly representing Tangier Zone on 20, 40 and 80 meters. His 54,648-pointer was shaded in Africa only by EL2N and CR6AI. A full break-in handswitching kw. is under construction for the '55 shindig. Carl signs W21UX when not on four for the U. S. Department of State.

»

## SOUTHWESTERN DIVISION

### Los Angeles

W6FSJ 148,296-148-334-C-85  
W6RW 148,257-153-323-C-80  
W6T2D 144,207-147-327-C-66  
W6MBA 98,651-119-277-C-51  
W6SRF 95,760-120-266-C-75  
W6R1D 92,208-113-272-C-60  
W6NZW 79,920-111-240-C-50  
W6M1R 75,048-106-236-C-50  
W60NS 67,569-101-223-C-68  
W6VBY 60,297-101-199-C-47  
W6SWG 50,392-92-182-C-50  
W6BPD 40,155-85-181-B-60  
W6BJU 44,928-78-192-C-50  
W6NTR 36,006-75-160-A-26  
W6APH 35,856-72-166-C-54  
W6NKR 32,832-72-152-C-34  
W6LWY 32,760-70-156-C-68  
W6SYG 25,790-61-130-C-31  
K6CFE 22,512-56-134-A-25  
W6C1Q 18,648-56-111-C-16  
W6NWL 10,989-37-99-B-30  
W6ID 10,209-42-81-C-17  
W6VVO 7425-33-75-B-46  
W6SWE 3312-24-46-B-15  
W6KNE 2193-17-43-A-24  
W6HPR 1881-19-33-B-10  
W6M1N 1092-14-26-C-7  
W6MYG 144-15-24-B-10  
W6AM (W6S ADP AM BXL GFL JTD)  
241,829-193-418-C-90  
W6EEK (W6EER LID LHN)  
176,400-159-370-C-50  
W6YRA (W6G CPH HQN WOO YPG)  
164,934-154-357-C-90  
W6QHS (W6S QHS TJL)  
69,788-102-228-C-76  
W6N1U (W6S MYG NJU PNZ SQY)  
12,402-39-106-A-60

### Arizona

W6GAL 7,235,875-185-425-C-88  
W7PZ 270-9-10-C-7  
W7ENA 84-4-7-A-4

### San Diego

W61RU 55,800-93-200-A-55  
W61HV 19,278-54-119-B-43  
W61RT 18,150-50-121-B-17  
W61AE 4446-32-46-C-10  
W6M1C 4134-26-32-A-25  
W6BZD 3978-26-51-A-30  
W6KJR 3102-22-47-B-12  
W6N62 3006-22-46-A-15  
K6LC 2508-22-38-B-15  
K6AAJ (W6S GIM NKU QBU)  
45,864-78-196-C-75

### Santa Barbara

W6YK 62,216-101-206-C-71  
W6ALQ 51,543-83-207-C-46  
W6ULS 34,881-77-151-C-70  
W6OHX 4374-27-34-C-27  
W6PQJ 3969-27-49-C-30

## WEST GULF DIVISION

### Northern Texas

W5RNO 93,696-128-244-C-65  
W0R5Z 11,868-43-92-A-39  
W5AJA 10,965-43-85-B-36  
W5QF 4785-29-55-B-19  
W50LG 4284-34-42-B-15  
W5AWT 2088-24-29-B-19  
W5ZWR/5 1152-16-24-A-15  
W51WK 693-11-21-B-22  
W0RJP 690-10-23-A-14  
W3BQU/5 144-6-8-A-12

### Oklahoma

W5DQV 64,872-106-204-B-50  
W5YJB (W5YJB W7PLI)  
105-5-7-B-4

### Southern Texas

W5ZD 46,332-99-156-C-61  
W5VIR 22,960-70-116-B-31  
W5W1N 2806-24-40-B-5  
W5YJB 2346-23-34-A-60  
W5TPD (W5S TEH TPD)  
7800-40-65-B-30

### New Mexico

W5VRP 34,410-74-155-B-60  
W51EH 4941-27-61-C-15  
W5KFL 351-9-13-B-5

## CANADIAN DIVISION

### Maritime

VE1ZZ 81,240-117-210-B-65  
VE1PQ 20,532-59-116-B-21  
VE1EK 10,400-40-88-A-27  
VE1UC 8992-39-76-B-13  
VE1GI 1428-17-28-B-18  
VE1HG 168-7-8-B-5

### Quebec

VE2WW 89,460-140-215-C-49  
VE2BP 7140-31-80-B-25  
VE2ATD 1512-18-28-A-15  
VE2UN (VE2RM W21HL)  
1296-18-24-C-24



### Ontario

VE3ZW 153,546-157-426-C-73  
VE3CK 82,251-111-247-B-70  
VE3AU 304-8-11-B-1  
VE3YV 300-10-10-B-5

### Manitoba

VE4RO 105,774-122-289-C-58  
VE4XO 48,057-83-193-B-52

### Saskatchewan

VE4JV 3544-22-54-B-5  
VE5PM 60-4-3-A-3

### Alberta

VE6MN 7722-33-78-C-36  
VE6VK 6696-31-72-B-25

## AFRICA

### Algeria

FA9RZ 29,601-33-299-A-27

### Anglo-Egyptian Sudan

ST2AR 1782-11-54-A-8

### Angola

CR6AI 67,464-36-627-B-5

### Belgian Congo

OQ5GU 40,698-34-400-A-5  
OQ5CP 18,768-23-272-A-25

### Canary Islands

EASRE 51,060-37-465-A-33  
EASBK 7776-18-145-A-43

### French Morocco

CN5EG 1188-9-45-A-3

### French West Africa

FESJC 12,432-28-148-B-5

### Kenya

VQ4EI 324-6-18-B-5

### Liberia

EL2N 100,980-51-660-B-27

### Lesotho

5A4TG 144-4-12-A-6

### Mozambique

CR7LU 2464-16-53-A-12  
CR7IZ 872-8-38-A-6

### Southern Rhodesia

ZE3JP 6099-19-107-A-4  
ZE3JA 4560-16-95-A-20  
ZE3JJ 2445-13-55-A-6  
ZE3JH 2250-18-43-A-20

### Spanish Guinea

EA0AB 1242-9-48-A-4

### Spanish Morocco

EA9AP 31,031-31-336-A-19

### Tangier Zone

KT1UX 54,648-33-552-B-60

### Union of South Africa

Z86FN 32,256-42-256-A-13  
Z86AO 357-7-17-A-2  
Z85V 6-1-2-A-4

## ASIA

### Aden

V89AS 3680-16-77-A-10

### Hong Kong

V86CG 1470-5-98-B-8  
V86AE 162-2-27-A-2  
V86C 90-3-10-A-12  
V86AJ 63-3-7-A-16

### Iraq

YI2AM 3822-13-98-A-12

### Japan

29,062-22-445-C-68  
JA3AF 22,500-20-379-B-51  
JA3AH 14,976-16-312-C-23  
KAS8C 11,256-18-264-A-40  
JA1CR 2873-13-75-C-31  
JA3AA 2172-12-61-B-6  
JA3JB 1250-10-42-B-12  
JA6AA 1092-4-91-A-9  
JA2AN 804-6-46-A-22  
JA2DN 252-3-28-A-8  
JA2WA 210-2-35-A-6  
JA1HC 120-2-20-A-6  
JA1WT 3-1-1-A-4  
JA1CF (JA1S CJGV)  
573-23-287-A-39

### Lebanon

OD5AN 10,820-20-182-A-20  
OD5AV 2244-12-64-A-6

### Ryukyu Islands

KR6AA 14,364-19-252-B-5

### Saudi Arabia

HZ1HZ 3081-13-79-A-5

### Turkey

TA3AA 18,900-20-317-C-38

## EUROPE

### Azores Islands

CT2BO 11,232-26-146-A-17

### Belgium

ON4TQ 11,792-16-246-A-23  
ON4RK 7074-18-131-A-30  
ON4UF 3285-13-33-A-6

### Czechoslovakia

OK1MB 61,295-41-506-A-2  
OK3RA 1206-9-45-A-6  
OK1AEH 51-3-6-A-4

### Denmark

OZ1W 25,038-26-333-A-4  
OZ7PH 8610-14-208-A-24



An exhaustive study of propagation curves for the Test put Spain's EA1CH in the winner's column for c.w. work. Other contributing factors: Rafael's home-built 14-tube dual-conversion superhet and 200-watt 813 p.a.



OZSKL 2112-11-64-A-  
OZSN 1872-12-32-A- 984AX 5840-16-124-A-28

# England

G5RI 60,840-39-520-B-44  
G4CP 39,153-31-421-B-32  
G2QI 21,450-26-275-B-40  
G3AZ 4734-18-89-B-30  
G3HJ 2015-13-52-A-B-25

# Sardinia

ISIAHK 1846-13-48-A-  
GM3EOJ 6132-14-146-B-20

# Finland

OH2MQ 3850-14-91-12  
OH1PW 3780-12-10-A-  
OH3NY 1080-10-35-A-  
OH3OR 420-7-20-A-  
OH8NV 342-6-19-A-  
OH1NV 36-2-6-B-  
OH5OU 12-2-2-A-

# Spain

EA4CH 6134-36-570-B-44  
EA1AB 36,730-32-59-A-38  
EA3GF 11,910-15-271-B-23

# Sweden

SM5ANY 9810-15-218-B-18  
SM3AZV 6615-15-148-B-  
SM5SX 5628-14-135-B-22  
SM6ACO 4424-14-106-B-18  
SM5ARL 3360-10-114-B-10  
SM7AVA 2691-13-69-B-  
SM5AYV 2145-11-63-A-16  
SM5IZ 1800-12-50-B-  
SM4UJ 1310-10-44-A-4  
SM3BP 756-9-28-A-  
SM4RE 276-6-13-B-  
SM6AMR 231-7-11-A-  
SM6AV 210-6-12-A-  
SM5UC 165-5-11-B-7  
SM7BY 63-3-7-A-  
SM2AQY 27-3-3-A-  
SM2AOO 12-2-2-A-

# France

FSVJ 26,784-31-290-A-25  
F7CZ 7995-13-205-A-  
F9RM 7860-19-135-A-21  
F8TQ 5781-9-103-A-13  
F8PM 4374-18-82-A-  
F3BR 864-9-32-A-  
F8SW 816-8-35-A-  
F8TM 33-8-3-A-  
F3CT 270-5-18-A-4  
F8LE 240-5-16-A-  
F7HIP (F7A) W3PMP 41  
WVM 69,432-33-702-B-92

# Germany

DL1KH 35,478-27-438-B-40  
DL1DX 25,920-30-288-A-28  
DL1HR 19,035-27-235-A-  
DL1W 16,317-21-200-B-28  
DL1XF 14,232-24-198-B-30  
DL1DU 11,960-26-154-B-24  
DL1ZU 11,520-16-240-B-20  
DL1N 7320-26-125-B-35  
DL1A 5520-20-92-B-28  
DJ1BZ 2576-14-63-B-15  
DJ3OC 1488-12-42-B-26  
DL1MN 1050-11-32-A-10  
DL1YA 864-6-48-B-  
DL1P 252-7-12-B-  
DL1HQ (DL1X) XG NT  
DL1A (DL1A) FF GB MS TQ  
VN 27,301-23-399-B-96

# Gibraltar

ZB2A (G3B) DIT GFM JBQ  
5560-23-276-B-

# Greece

SV0WE 1156-8-61-B-9

# Iceland

TF3MR 26,800-25-361-A-  
TF3AB 19,052-22-292-A-

# Ireland

I15G 11,004-21-181-B-20  
I19J 6528-17-128-B-7  
I15F 2717-11-83-A-12  
I16D 339-7-26-A-  
I19F 405-9-15-A-6

# Italy

IIALU 8880-16-185-A-13  
IIEK 511-7-25-A-15

# Jan Mayen

LO8YB 910-13-24-A-3

# Netherlands

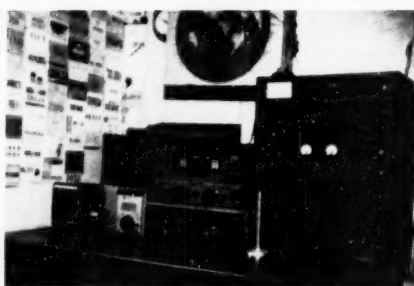
PA0LP 45,030-30-508-A-83  
PA0GN 27,540-30-306-A-70  
PA0VB 21,222-27-262-B-34  
PA0V 7140-20-119-B-  
PA0XD 6017-13-170-A-  
PA0WAC 3348-12-93-A-11  
PA0LY 1750-10-59-A-  
PA0RPF 1248-13-32-A-  
PA0TAU 1080-12-30-A-  
PA0HJL 1032-8-43-A-4  
PA0GJN 540-5-30-A-  
PA0UL 103-5-7-A-

# Norway

LA6YC 8860-13-229-A-20  
LA3HA 3600-10-120-A-16  
LA7D 3060-12-85-A-46  
LA6U 2580-10-86-A-4  
LA4K 1160-10-39-A-17

# Roumania

YO3RF 1150-10-49-A-4



P.p. 80% make up the "California kilowatt" of W6LRU. Don's 55,800 points, biggest Stateside c.w. total in the under-100-watts category, earned him the San Diego certificate.

# St. Pierre & Miquelon

FPSAP 34,300-28-415-A-21 DU7SV 32,758-22-502-B-

# Philippine Islands

# Salvador

YS10 4876-23-72-B-3

# SOUTH AMERICA

# Virgin Islands

KV4AA 532,080-80-2221-B-

# OCEANIA

# Australia

VK2GW 101,660-46-737-A-63  
VK3NK 26,286-26-339-A-32  
VK3AH 23,995-33-239-A-34  
VK3FO 10,380-50-173-A-16  
VK2QL 5016-22-76-A-  
VK3NB 1463-11-45-A-  
VK2HZ 999-9-37-A-4

# Canton Island

KB6AY 67,440-40-562-B-27

# Cook Islands

ZK1AB 5312-16-111-A-

# Fiji Islands

VR2AS 9823-19-179-A-6

# Hawaii

KH6JJ 479,556-84-1903-B-73  
KH6MG 428,108-76-1879-C-74  
KH6PM 221,697-63-1173-B-48  
KH6AYG 145,836-46-1056-C-54  
KH6ANK 102,237-53-643-B-  
KH6WW 12,978-27-158-B-  
KH6ABY 81-8-9-A-

# Marshall Islands

KX6HU 45,465-35-433-B-17

# New Caledonia

FK8AO 16,002-18-301-A-40

# New Zealand

ZL1RY 133,680-60-746-A-  
ZL2G3 88,752-43-688-A-61  
ZL1MQ 75,405-55-452-A-33  
ZL3OP 50,898-34-500-A-30  
ZL4RO 36,636-43-286-A-16  
ZL1DJ 13,455-15-299-A-12  
ZL3AB 9729-23-141-A-

# British Guiana

VP3YG 179,630-55-1090-A-34

# Colombia

HK4DP 118,088-58-687-AC-49

# Netherlands West Indies

PJ2AI 56,448-42-448-B-20  
PJ2CE 42,980-28-512-A-39

# Peru

OA4J 10,868-19-193-B-46

# South Orkney Islands

LU7ZM 4104-12-114-A-8

# Trinidad

VP1LW 7236-12-203-A-

# Uruguay

CX5CO 4320-12-120-A-

# Venezuela

YV5DE 36,972-36-343-B-  
YV5AB 2046-11-62-B-

\* W3NOH, opr.  
\* W4TKY, opr.  
\* Hq. staff - not eligible for award.

\* W4RWL, opr.  
\* W1HPT, opr.  
\* W1WQ, opr.  
\* W3MSK, opr.

# 'PHONE SCORES

# ATLANTIC DIVISION

# Eastern Pennsylvania

W3BES 202,168-148-456-C-80  
W3GHS 80,444-119-226-B-46  
W3EQA 32,956-77-144-C-56  
W3BS 14,691-59-83-B-30  
W3QLW 90-5-6-B-4

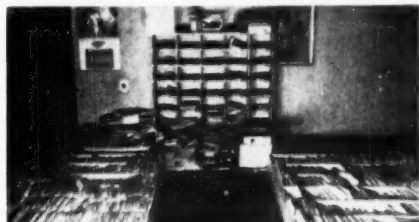
(Continued on page 138)

# How's DX?

CONDUCTED BY ROD NEWKIRK,\* W1VMW

## How:

Burgeoning DX hounds and DXCC candidates become more numerous day by day. And the quest for communications confirmation documentation — QSL cards, that is — increases apace. Once again it is timely to stress minimum data requirements that can distinguish a bona fide QSL from a meaningless piece of paper so far



Time out for photography at the bustling ARRL, W6 QSL Bureau, W6 TI proprietor. (Photograph courtesy Northern California DX Club)

as the DX Century Club is concerned. You'd drop your inferior maxillary at the number of cards we see that fail to bear this essential information:

- 1) Call of the confirming station.
- 2) Call of the confirmer.
- 3) Location of the confirming station (not necessarily the postal address).
- 4) Statement that a QSO is being confirmed.
- 5) Date of QSO.
- 6) Emission designation (signal report usually suffices).
- 7) The signature (or initials, first name or surn) of the person who made out the confirmation, especially important on a multi-operator station QSL.

We're not eager to "bounce" QSLs merely because they fail to meet arbitrary standards; our interest lies only in determining beyond reasonable doubt that they are confirmations. Here are specific examples which demonstrate how and when certain of the listed data become important (specifications 1 and 2 considered necessary in every case):

KC6, LB, VP8, etc., QSLs from stations whose call signs are not necessarily indicative of DXCC countries wherein located (Point 3).

Eastern European, etc., QSLs that may not be distinguishable from SWL cards (Point 4).

QSLs from Newfoundland, Palestine, "banned" countries, etc., wherein dates of legality are important (Point 5).

Confirmations that are to be considered for phone DXCC credit (Point 6).

QSLs rendered doubtful through confusion resulting from multi-operator station operation, cards made out by assisting volunteers, and the like (Point 7).

\* DX Editor, QST.

<sup>1</sup> Signal report, time and band, added to the "DXCC items" tabulated, will meet QSL requirements for most world-wide DX awards.

<sup>2</sup> Also see "QSL Cards," *Morrow*, October 1950 QST.

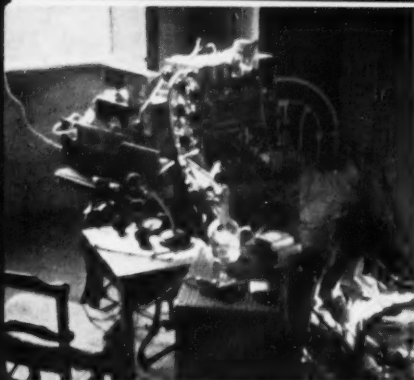
If you are "QSLing first," and expect someone to refer to his log upon receipt of your card, it is logical that the time and band of QSO also should appear, although these items are not DXCC musts.<sup>1</sup> Ticklish business, isn't it? And this isn't the half of it.<sup>2</sup> But it should give you ideas on what to watch out for in the line of useless QSLs. When you do receive a would-be QSL that you believe is incomplete, by no means alter it. Obtain another, calling the discrepancy to the attention of the sender.

In addition to its role as documentary evidence of communication with your station, your QSL card inadvertently is a display piece, a postal ambassador of good will, and an advertising flyer for your station. To keep these functions in mind when preparing your pasteboards will do no damage to your QSL returns percentage!

## What:

The homestretch of summer developed enough interesting activity to jar the complacency of the most cloyed DX appetite. DXpeditions became the rule rather than the exception and two rarely worked ARRL DXCC Countries list specimens were on effulgent display — VR2BZ ZM7 (Tokelau Islands) and F8W FC (Corsica). The local scene was well represented, too, with DXhaustive performances by KC4AB and XE6AM on Navassa Island and Todos Santos Island, respectively. . . . HB9LA's jaunt to Corsica in early August set off the fireworks with a resounding boom! Then XE6AM checked in to put a rare prefix on v.h.f., 14, 7 and 3.5 Mc. (see pp. 62-64). Resultant raked entries had hardly dried in numerous logs when VR2BZ scooted over to the Union Islands in mid-August with a 5-watt rig to produce the first recorded postwar QSOs with that area. Next, teen-agers W1QW, W4VZQ and WN4HBC took the baton by carrying out their threat to put Navassa on the air for the first time since old KINI





The Corsican caper of F8FW/FC (HB9LA) lasted from July 31st through August 11th, resulting in 2411 contacts with 70 different DXCC-List countries. By bands, F8FW/FC worked 103 stations on 3.5 Mc., 522 on 7 Mc., 1654 on 14 Mc. and 132 on 21 Mc. At left, above, we see the F8FW/FC layout in lodgings at Bonaficio, the rig an 813 final modulated by p.p. 80's, and the receiver a 22-tube double-conversion superheterodyne. A 360-foot long-wire, 100 feet high, did the radiating. The jolly threesome at right are F9QV's NYL, F9QV, and DXpeditionary visitor HB9LA photographed against representative Corsican background. The hospitality of the F9QV's was highly instrumental in allowing HB9LA to carry out his venture so successfully. Obstacles surmounted included dire customs difficulties, almost nonexistent Corsican transportation facilities, blown transformers and smashed 806's, and an abortive shack fire. HB9LA had intended a few days of Monaco hamming on his return trip to Switzerland but "enough was enough!" (Photos courtesy HE9RDX, USA)

vacated those premises in the early '30s, rolling up hundreds of KC4AB QSOs with their TB8-50. All this, with G2RO/Asia, SV9UN Crete, LH2P Spitzbergen, CR8 FU8 HE1 HK6AT and ZD3 lurkers serving as a star-studded backdrop, verily turned August into some DXtravaganza! Yet, despite these successive and almost continuous DXpeditionary pursuits the gang managed to corral a neat assortment of the more stationary stations, band by band as follows.

Twenty c.w. usually is inveigled to make with Southern Hemisphere QSOs around autumnal equinox time. VKs ZLs and Z8s, along with their rarer neighbors, should be making a shambles of 14 Mc. as you read this. W4YDT goes past the century mark with CR5AF (95), EA9EB (80), FQ8AF (83), GC2FZC (30), HA5BT (70), ISPP (70), KB6AT (40), LZ1KPZ (90), MB9BJ (40), OX3AY (90), SV1SP (50), VQ4EN (60), VRs 2CY (25), 3A (50), YO3GY (80), YS10 (40), ZB1AJX (82), ZK1AB (30), ZP3GM (80) and 9S4AX (12). . . . AP2K, DU6IV (64) 12, ET3S, FA3s 3LY 9VN (60) 23 0, FF8AJ (70) 17, MF2AG, MP40BB, ST2AR, SV0WL, VQ8CB (50) 0, ZC6UN, ZD2DPC (10) 21-0, ZS9I and 4X4BX are freshly entered in ZD6HNS's log, times GMT.

CT2-BHO 3AB, EA9AF (14) 22, EL2X (100) 16-17, F9QV, FX (11-49) 22-23, FK8AL (69), HA7OL (46) 20, JA3BB, KA3 2ED 2ZZ (98) 13-14, 9MF, KR6s AA (54) 12-13, OH OS, LU8ZS of So. Shetlands, OD5s AV LJ (45) 22, SP9KAD and ZD9AB (79) 12-13 swapped sigs with W2ZVS, all times GMT. Dixie worked SV9UN, Crete (52 17) as a topper and heard two jazzy prefixes: KFF6 and CZ1. . . . W3LEZ raised IS1TAW, I1BLE/Trieste 23, JA5AF, KA8RH (55) 4, ODSIC (17) 20-23 and a ZB1, times GMT. EA6AW (67), JA7CP, VP3LF and YO2KAB (87) got away. . . . An LZ1, ZB1DK (12), a ZD9 and 4X4FW (18) traded blows with W4YHD. Jim heard juicy VR5IP (45) 1 EST come back to W3LOE. AP2C and FQ8AC (60) 0 also escaped. . . . W5LV, with only a 50-watt Elmac rig-receiver, has 140 confirmed countries. CR6AI (21-100) 21-22 GMT, GD3FB and LU3ZS of Antarctica are among his latest. . . . A five-eight-hundred ground-plane drove W7UAB's 80 watts home to DU7SV (85) 7 GMT, FK8AO (90) 3 4 KA2GE and KX6NA (80) 3. . . . K2GFQ busied himself with a Corsican F8, an EA9, HZ1AB (50 100) 12 21 and ST2NG (40) 20-23. . . . With the addition of CR6CS, EL2L, LU1ZT (68) 12 GMT, ODS1X, a ZD9 and ZB1AUV (95) 16 CST, it's 125-117 at W9KXK. . . . A new 278-foot Vee captured HA5KBX, OY3GA, SV0WE, VQs 2W 4EI and a 15-watt YU3 for W3WPG. . . . QSLs from VP3YG and ZD9AA brought W8DLZ to the 106-mark. . . . Here's what KR6OS runs into on Okinawa: AP2C (32) 12 GMT, CR7s AF CH (88) 17, CR8AB (20) 12 QRS, CR9AF (8, ET2PA (32), KB6AP, KM6AX (88) 4-11, MP4QAH (32) 12, OQ5s BB (32) 15, PU (88) 14-15, RU (20) 17, VKs 1HM ZC2 (32) 13 who

QRTs in November, 1PG (20) 11, 9AU 11, 9DB 13, 9YY (50) 22, VQs 2AB (32) 15, 4EG (32) 15, VSs 2DW 2EB, 2EG 6CT 6CW, VU2s CS (50), JK (20), KV (32-88) RC, YO3RF (88) 19, ZC4IP (88) 16, 4S7s KH (35), LB (60), NG WB, 4X4s FF (40 18) 11 and FQ 18. . . .

Meandering among the miscellany, we find at W1UBC: EA9DF (45) 20 GMT, FA9VN (62) 23-0, VP8s 4LZ 6EB and YV5AB, ZD4BQ and ZS3P bring Richard to No. 99. W4BFR: a Corsican F8, W4YDT (heard): FQ8s AD (81) 23 GMT, AG (10) 3, KS6AE (80), TA3 2EFA (75), 3US (20 30) 22, VQs 2PL (40), 5EK (32) and ZD6BX (25-50) 12, W5BJG, CX2AM, W5WZQ, CX2BP, FANRJ (10) 21 GMT, HP1BR (20), KA2KS (60), OA4C, VP7NV and ZP5HC, W9APY 5 a Rio de Oro EA9, W0IUB-FA8DA, HKs 1TH 4DP, KA2CR, VP8s 1GG and 2SH. . . .

W9EU awaits QSLs from CE0AD (6) 21-22 EST, CN2AO (2) 21, DU1AP (57) 8, IS1CXF (62) 17, LZ1KA (32) 15, MF2AL (9) 16 17, MP4QAO (15) 21-22, PJ2CE (100) 20, SP3AN (43) 18, VQ4CF (32) 17, VR2JB (76) 21, ZB1JG (17) 16-17, ZC4GF (47) 17, 4X4DH (37) 17-18 and 5A2FA (26) 17. Alex says we'd all work more DX if we all made shorter calls. . . . CR6CZ, HA5KPB, JA3 1AA 2AN 3AX 3DY 4AF 5AB 6AO 6FB 7AD 8AL, ZB1BC and a ZC5 made it a neat 146 for W3AXT of DXerama fame. . . . The DXer of the No. Calif. DX Club mentions C3s AR (15) 23, TK (80) 8 of Formosa, CR9AI (80) 7, DU1DO (65) 0, EA9DZ (90), FK8AB 22, HA5BJ (40) 22, MD5VR (65) 9, ODSAC (50) 21, OY3UF (75) 12-13, PJ2AL (89), SP3 3AK (16) 21, 5BQ (90) 21, SV1AB (10) 10-11, VS9AC (39) 21, YO5LC (25) 21 and ZAIAC (65) 13-14, times PST. . . . In the So. Calif. DX Club Bulletin we note notes on VK1s DY (21) 22 PST, EG (85) of Antarctica, VQ8CB (50) 0, VU2s AE 8, FX (22) 8, ZB1KQ (45) 13, ZC5s G (64) 3 and SF (20) 0. . . . AG2DX (43) 21-22 GMT, CP3CA (48) 22 23, CR7AD 18, CS3AC (40) 13 of the Azores, EA9AB (70) 22, FB8NX (50) 5, FF8AP (92) 20, FM7WD (83-110) 13, FQ8AG (25) 20, FQ8AC (154), FY7YP (35) 12, HP2TP (28) 1, Trieste IIs NU (28) 16, YCV (25) 23, IS1AHK (20) 22, IS8 SG (87) 20, WP (63) 21, KX6s BI (73) 4, NA (80) 3, OQ5ER (146) 13, SU1BB (12), TF3 3AB (52) 21, 3MB (42) 0, 5SV (35) 23, VKs 1GA (48) 3, 9AC (12) 22, 9IRM (40) 7, VQ5BZ (44) 20, VR2CG (60) 19-20, VS9AS (20) 23 0, YI2AM (45) 21, ZC7IB (70) 19, ZD4BT (69) 1, ZK1s AR (32) 3-4, BI (25) 7, ZM6s AB (77) 6, AS (10-174) 4-6, AT (160) 5, ZP9AY (22) 22-23 and 5A3TC are among items tabulated in the West Gulf DX Club's DX Bulletin.

Twenty 'phone and the WGDXC Bulletin also are good friends: C3AR (285), CP5EK (121) 2 GMT, CR5SP (190) 21 of Sao Thome, EA3AD (158-205) 22-23, 8DE (180) 23, 9AI (175) 0, 9AR (178) 23-1, 9AC (155) 21-22, EL2X (147) 22, FQ8AD (110) 5-7, FQ8AP (186) 23, HZ1AB (199-340) 21, IT1s BA (161) 23, BNX (170) 0, KB6BA (189) 7, KG6s AAY (210) 12, IG of Chichi Jimm,

KJ6FAA (196) 4, KR6AZ (203) 13, KTIWX (184) 0, OE13WD (18) 21, OD5BA (120) 21, OQ5s EC (115) 19, FN (121) 20, FO (130) 19, ST2NW (158) 23, TA3AA (135) 21, VK9s CS (186) 6, DB (179) 2, GM (125) 5, SP (140) 12, YT (190) 13, VP1 IGG 2DL (123) 2, 21N (118) 1, 8AZ (50-150), VQs 2DT (120) 19, 4AC (130) 20, 5EK (115) 20-21, VR2s BZ (155) 5, CX (120) 3, CY (183) 4, VS2EB (158) 12-13, VU5AB (140), YI2AM (145-200) 20-22, ZBs 1CM (196-318) 23, 2A (120) 20, ZC7DO (140) 21, ZDs 1SW (196) 15, 4BL (95) 22, 9AB (168) 12-13, ZM6s AP (145) 4, AT (161) 4-5, 3V8AS (200) 20-21, 4X4s BJ (120) 20, DK (100) 23, FK (100) 23, 5As 2TZ (331) 0 and 3TC (110) 23. . . . A Corsican F8 and YU1GM (136) 21 GMT brought W1WQC to a 20-meter 'phone tally of 106.98. . . . W6YY recommends KC6s AA (200-240) GMT, SJ UZ, KP6AK (220), VK1HM ZC2 (172) 7-16, VR3A, ZD3BFC (95-115) 16-18 and ZC5VR (204) as likely 14-Mc. A3 customers. . . . HIGEC (178) 2, a Corsican, and OE13JM (194) 22, times GMT, made the grade with 3AXT. . . .

Spotted by the Newark News Radio Club gang on 20 'phone were CPs 1AQ 5AB, CS3AC, DU-1AL, IAP 1RS 7SV, EL9A, ET2US, FA3s PP QF, FM7s WF WN, FO8AB, GD3ENK, HHs 2EM 2X 3L, HIRWE, JA-1AC 1AK 1AX 1BB, KA2s AA AK HMI IM LG LJ MY NA NY RD RG YA, KA3s AC CR MD RD, KA-4DR 5CW 7HH 7RC 8AB 8RK 8SC 9LR, KB6AQ, KG6s ABN AFU GN SB, KJ6AS, KM6AX, KR6s AY KS NB UA, KW6BB, KX6s AF NB LX1DA, MU2s AA AL, OE13AA, OX3EN, PJ2s AQ CA, SP5AL, SU1s MR SW, TA2EFA, VP2s DC KB, VQs 3EO 4EHR, YS1S, ZD4AK, ZE3JP, ZP5BV, 4X4s AH BO, 5As 1TZ 3TF 3YG 4TK 4TL 4TR, 954s AC and AD. . . .

Forty c.w. treated W4TJI to a haul of VKs, ZLs, CTs, 1DJ 3AB (22), EA9DE (30), HC1LE (18), LU1ZT (22), PJ2CE (22), VP6cT (25), Grahamland VP8s AA (33), AO (20), AZ (15), YU3ABC (21) and YV5BJ (30). Paul's new ground-plane swiftly raised his count to 66 7-Mc. countries. . . . A new 40-meter folded dipole helped VO3X to CR6AI, CT2BO, FF8PG, KG4AN, VP8s 4LZ 7NV, YI2AM, YU2ADE and YV5DE. VQs 4RF 9AC and VS9AS are still on Horace's stalk list. . . . FP8AP, HK1TH, SP9KJ, TL2s CR PZ, VP6s 6KL 8BE, YU2AKL, YV1AD, ZD4BG and others cheered W3WPG. . . . W3AXT collected San Andres Island's HK9AL, a CT2, four VP8s, LU2s XI YA, LZ1KDP, PY8SG 9CK and YS10. . . . The newly franchised Austrian nationals are hitting forty in force. W4YHD reports QSOs with OE8s 3SE and 7BL. . . . Now a peek at loggings here and there, at W7WAT, OZs, OKs and a CT2. W7YYM heard VKs 1AC 11 GMT, 9PF (E3) 10-12, W2ESQ: a Corsican F8, a Y8I and ZM6. W6WZQ, ZM6AI (20) 4 CST, W6BCT, VS2DW, W6ZOL, a CR6 and VP8. W7OYQ heard UA9 9KOG 9K6F, UIRKAA, W91PY 5, Corsica, Grahamland and an HK9. . . . WGDXC specifies FK8AJ, VK9s DB (20) 11 and WZ (6) 11 GMT. . . . NNRC lists forty 'phone candidates KG6s ABN GN, KM6BG, KL7s AWR AYN BBL, OA5M and PY2CA, plus dozens of KIB6 actives. . . . Another August DXpeditionary item: W6YC ran into ZK1AB P on 7001 kc., a 15-watt operating on Tongareva (Penrhyn) in the Manihiki group. . . .

Eighty c.w. by now should be complainant toward the surmount signals that were swallowed up in summer's QRN. ZK1BG writes: "I've just about given up 20 and am concentrating on 80-meter DX. So far have worked 19 countries. Eighty seems to be the most consistently clear band here." YV5AC has been evading Doug but VK1AC succumbed. . . . KL7VOZ likes 3.5 Mc. between 0 and 2 AST. VK4AHJ, ZLs 1AH 1AHJ 1AU 1AM 1MQ 3JT 1CK and 1GM were worked, all around 3510 kc. . . . VP8AZ contacted W3AXT and W9AND. W3AXT also captured DM2ABL, F8FW EC and PY6AK. W9AND hears VP8AQ (3) around dusk on 80. . . . A QSL

from JA2WA will give W6ZOL a 3.5-Mc. WAC. . . . F8FW EC gave K2BZT a lively time. Hayden also broke through August static for Gs 2QB 3HWF 3JAF 6ZO 8JR, OZ1X, a PY6, SM5AND and VP4LZ. VE3ZZ tells K2BZT to keep an ear open for OY58 (1), 18 0 GMT. . . .

Fifteen 'phone remains an interesting proposition at KA2KS. W2DNO's mike work there rooted out 21-Mc. 'phones DU7SV, HZ1HZ, JA8AE, KA2AS, KG6GX, KH6AVR, KL7BBP, KR6s OH OQ, KX6NB, TA2EFA, VK3PA, VS1FE, ZL1BY and 487YL. MMs W3JY, W3OZA and W6KUY also were worked. . . . W6ZZ did okay with HC2PG, KH6s AIO AQ AR BAK, KV4BD, LU8FAO and TL2BX. In the MM line Miles encountered W6s DOW MZV and UZI. . . . CE2CL, FF8BG, HC2PS, HP3s DA LE, OA4C, OD5AV, PJ2s AB AI, VP1GG, VQ4AQ, ZLs 1GW 2BN and ZP5DC are 15-meter A3ers accounted for by NNRC. . . . Fifteen c.w. will bear scrutiny henceforth. WIRB's 21-Mc. c.w. QSL, from FY7QC confirmed a country WIRB couldn't come to grips with in 25 years of 20-meter efforts. . . .

Ten 'phone hit low tide in August and September but W4NQM's sleuthing determined that W3BVL, eighth VP6ER, W4ABU, HC2PT and LU7QB, W4TOJ, LU3AAT, W6BJP, HC1RT and a VP6. . . . CE2HL, EA3IR, IISVK, YU1GM and many South Americans recently were logged on 10 by the NNRC contingent. . . . Ten c.w. is down but not quite out. G3IDG specializes in 10-watt 28-Mc. c.w. shenanigans and has been QSHing Gs, GMs, DLs, HB9s and YUs via the sporadic-E route. . . .

One-sixty, seventy-five and, yes, even eleven may well be represented on our monthly megacycle merry-go-round as W VE warm weather wanes—good fishin', OM!

## Where:

OVSU (Austria) has its QSL bureau rolling under full steam at Kierlingstrasse 10, Klosterneuburg, and cards destined for OE8s no longer need be sent via ARRL. . . . Ex-KP6AG writes from Canton Island to the effect that he does not and cannot handle QSLs for Palmyra Island. "I have not been to Palmyra for five years and I have no information regarding addresses of former Palmyra hams. . . .

W4LYV regrets that he cannot assist in the confirming of FG7XA QSOs for 1952 and 1953. Chuck already has disposed of one short listing of 1952 FG7XA QSOs and has no further info or QSLs to impart. . . . Several Gs claim recent results from the UB5CF address to follow. . . .

One SY9UN/Crete has been instructing "QSL via ARRL." Where? . . . For the following individual items give W1s APA RR RDV UED WFO WFR WQC YYM ZDP, W2s BVS WZ ZVS, W3s AXT NKM WPG, W4s YHD YZC, W5WZQ, W6DZU, W7JLE, W8EV W9s APY 5 CFT EU, KL7PI, KR6GS, ZD6RX, NNRL (Norway), NNRC Bulletin, NCDXC DXer, WGDXC DX Bulletin and WIA (Australia) much thanks. . . .

CN8HY, Navy 214, Box 50, FPO, New York, N. Y. . . . CR9AI, Box 28, Portuguese Macao. . . . DL4QY Cpl. N. B. Reilly, Signal Branch, APO 742, % Postmaster, New York, N. Y. . . . F8FW/EC (QSL via USA) . . .

FA8MB, Mostaganem, Algeria. . . . FF8AJ, Box 396, Abidjan, French West Africa. . . . FORAK, Georges Handerson, Avenue du Cdt. Chesse, Papeete, Tahiti. . . . FQ8AF, G. Cnaut, P. O. Box 662, Brazzaville, French Equatorial Africa. . . . GB3SFS (QSL via RSGB). . . . ISPP, % Post Office, Mogadiscio, Italian Somaliland. . . . ISWF, % Post Office, Mogadiscio, Italian Somaliland. . . . JZ6AA (QSL via VK9YY). . . . ex-KA8RH, RFD 4, Sparta, Tenn. . . . KG6SB, Navy 945, Box 14, FPO, San Francisco, Calif. . . . OE5AH, Anton Hapsburg. . . .



Sonnberg, Hollabrunn, Austria.....ST2AR, A. E. Dowdeswell, Box 253, Khartoum, Sudan.....ST2NG (ex-ET2NG), P. O. Box 516, Khartoum, Sudan.....ex-SV9WA, Col. E. J. Beller, Gen. Del., Santa Barbara Calif.....UB5CF, Box 52, Odessa, Ukraine, U.S.S.R. ....ex-VK1AF, A. S. Little, VK5AF, 32 Elder Terrace, Dandee Gardens, S. Aus.....VK9HO, H. T. Overend, % RTC, Kavieng, T. N. G.....VK9WG, Torres Crescent, Port Moresby, Papua.....VR2BZ/ZM7 QSL to VR2BZ.....ex-W5YAA/KG6 (QSL to W5YAA).....YK1DF (QSL to YK1AJ).....YN1CC, % Spanish Embassy, Managua, Nicaragua.....ex-YN1WC, Wayne W. Cooper, % Tropical Radio & Telegraph Co., Guatemala City, Guatemala.....ZD4BS, Ken Shaw, 89 Coy. WAASC, Rangoon Camp, Accra, Gold Coast.....ZD9AB (QSL to ZS1FD).....ZM6AS, Les R. Head, % Bank of New Zealand, Apia, Samoa.....ZS3AG, Mrs. M. E. van der Lande, P. O. Box 263, Tsambeh, South West Africa.....ZS3AH, J. Swart, % Postmaster, Goshub, South West Africa.....4S7LB, L. H. Blok, Box 907, Colombo, Ceylon.

## Whence:

Asia — JAI1AA briefs us on several certificate DX awards now available from JARI (Japan): AJD (All Japan Districts), based on QSO with a station in each of the JA call areas, JAI through JAP; JAY is now a mainland call area (ex-JAZW) and JAB is ex-JA1W. WAJA (Worked All Japan Districts), based on QSO with each of the 46 Japanese prefectures. JJC (Japanese Century Cities), based on QSO with any 100 of 380 specified cities in Japan. Also obtainable are four new SWL awards. IRCs are necessary in most cases. As we recommended with each such overseas DX award publicized in "How's," write the societies sponsoring the awards in which you are interested to ensure your having full and accurate up-to-date information. Rules and qualifications changes are not infrequent among the majority of world-wide certifications now offered. K6IV already has won the first Stateside AJD diploma. JAs ICR and 4BB are closing in on the first postwar Japanese WAS achievement. JA1CR with 41 confirmed.....JAs AA CJ and CR, with aid from JAs CO GV and KE, are planning 160-meter tests for the coming low-band season.....Via W1WPO, W4PNK, and others, we hear that AC4N has left Tibet for North India. This could be the last of the AC4s for some time.....OD5LJ helps pass out Lebanon contacts with an 11-tube superhet and a mere 6L6 final.....KR6AA expects to be back at the old WAVE stand sometime this month, possibly reassigned to Ft. Benning, Ga.....W0BID learned that prewar J6IV is listed among wartime fatalities.....September activity by YK1DF, a half kw, on 14 Mc., was a feature of the Damascus, Syria, International Fair. YK1AJ was the motivator.....From KR6OE (W3YKS, ex-W5ZRV) on Okinawa doings: "We operate mostly 20 on voice (14, 200-14,300 kc.), a bit on 15 (entire band) and 40 (c.w. only, 7100-7150 kc.). We also work some 20-meter c.w. (14,000-14,200 kc.) and, if open, hit 10 and 11." The "we" being the majority of members of the Okinawa Amateur Radio Club, which organization is contemplating arrangement of a world-wide ham-style "Okinawa Day.".....KR6OS (W9CDK), one of Okinawa's c.w.-bound minority, is most active between 1200-1900 GMT around 14,030 and 14,085 kc., with a modified BC-610 rig, BC-779 receiver, 8JK and ground-plane antennae. All KR6OS outbound cards are sent via bureau, or direct when requested. If you're still in need of a KR6OS QSL, reapply; incoming cards occasionally go astray.....As noted by the WGDNC contingent, CR9AF figures to remain active for at least another year and VS6CQ is CQing on 160 meters.....W9KOK mentions a Bhutan possibility who needs only a receiver to start dishing out AC5 QSOs. Contact Mitch if you have any ideas.

Africa — "Have rebuilt the rig here with improved results, especially the tone and keying. Using three 807s in parallel and a long-wire antenna, but a beam is progressing despite material shortages." This from ZD6BX who has radiated with over 90 countries since hitting the Nyasaland ether in April. WITYQ was Vic's first New Englander. ZD6BX would like to work more 7 Mc. but a local b.c. rig on 7200 kc. makes things tough in the local BCI department.....ZD3BFC QSLs are getting around in force. This Gambia number employs 20 watts, an SX-28 and a long-wire.....VQ2GW is preening for 80-meter operation and is experimenting with a square loop all-band skywire.

Oceania — NCDXC (W6GPB) lists these VK1 calls issued so far, all QSLable via WIA (Australia): Macquarie Island, AC AE AF BA BS EM JT JW RB RD RF RG RI, RR SW WO YM ADS; Cocos Islands, BJ HM; Heard Island, DC DY FE HV JG KJ NL PG PN RA SD SK VU WO YG; Antarctica, EG. Anybody worked 'em all? VK1AF now is VK5AF; 1FE, 4FE, 1HV, 4HV, 1PN, 3PN, 1RD, 5RD; 1RG, 5RG; and 1YG, 2YG. You'll note that a few of the suffixes were authorized for dual locations.....W6DZZ finds that VK1DY's Heard Island operation ordinarily is limited to 0530 0600 GMT because of power shortage, FB8-XX and ZZ pop up now and then on 20 but FB8XX also has occasional power difficulties.....W1WPO recorded the first postwar Sarawak credit, a VS4RO confirmation on behalf of W0EIA. The latter broke the Brunei ice in '52 as you will recall.....ZL1GW, once set up at the 160,000-kw. Arupuni, N. Z., power station must then have had little concern for line-voltage regulation.....Oceanian tidbits courtesy W6YY: KC6AA, Yap, is most active on 7 and 21 Mc. Truk KC6S SJ and LZ are workable on 20. ZC5VR avows increased activity but VR3C knocked off for '54 as of mid-July to leave Fanning availability in the hands of VR3D. There is no British Phoenix VR1 activity as of this writing. KP6AK recently fired up a TBS-50 on Palmyra and VR6AC is about to join VR6AY as a Pitcairn active.....From VR2AS, concerning recent Tokelau doings: "VR2BZ is one of the crew of an RNZAF Sunderland making a government visit to the islands. He was fortunate in getting permits to use the call ZM17 during this short stay. Very little time was allowed for preparation but he managed to stow aboard a ZC1 rig for 40 and 80 and used another rig for 20. In all he had approximately 60 contacts. He had intended using 'phone but for some reason his 'phone crystal gave up the ghost." VR2BZ/ZM17 bumped into ZM17A (ZM6AR) on the islands and noted that the latter QSO'd a few locals. Watch for more extensive ZM17 activities henceforth.

Europe — Leading DXers per Finland call area are (worked/confirmed) OH1NK 161/132, OH2RY 206/176, OH3OR 180/124, OH4NF 172/152, OH5NK 173/153, OH6NZ 188/166, OH7OL 113/90 and OH8NG 104/97.....In addition to PA0s you are likely to encounter special Dutch prefixes PA1 PE1 PF1 PH1 and PJ1 (not Curacao) on ham bands.....In 1948-49 PA0MOT signed PK calls 2XG 6XG and 6XZ. He has the logs and is willing to swap QSLs with those who still need confirmations. PA0MOT's Call Book QTH will suffice and full QSO data are requisite.

South America — W3DKT walked off with both the c.w. and 'phone U. S. A. awards in the 1952 LABRE (Brazil) DX Contest, results just finalized. PYs 4IE 4RJ and 9BR run 1-2-3 in the Brazil 'phone section while PYs 1ADA 3QX and 1MK did likewise on c.w. Participants in last month's LABRE DX Test should have a good start toward WAA and WAB certificate awards.....DXers will regret the appearance of PY7WS in this issue's Silent Keys. Batista, an all-band enthusiast, possessed DXCC membership with 170 countries confirmed.

Hereabouts — G3AAT/OX, of the British North Greenland Expedition, had a flock of QSTs delivered by the Danish Sledge Patrol.....W6FSJ scheduled a business jaunt to PY3 territory and TI2TG headed for a permanent



Navassa light.

W6 location.....The annual joint meeting of the Northern and Southern California DX Clubs is scheduled tentatively for January 15th-16th at Fresno's Hotel Californian. W6TL, chairman, is the bird to keep in touch with.....KC4AA (W1PST) and KC4AC (KP4TF) contemplate Navassa work à la KC4AB before year's end. W4s QCW VZQ and WN4HBC found the island itself, a 2-by-1-mile affair with 60-foot cliff sides, a proper obstacle to top preceeding difficulties in gear-gathering, transportation and customs clearances. The boys peeled off a reported 1350 QSOs on 80, 40 and 20. Just as the XE gang pitched in to help out FO8AJ, Cuban amateurs gave valuable assistance on the last leg of the KC4AB sortie when customs difficulties reared their ugly heads. All in all, a DX job well done!



# The World Above 50 Mc.

12.5-12.9 2300 2450 3300 4500 5450 5925 10,000-10,500 21,000-22,000 50,000-9

CONDUCTED BY E. P. TILTON,\* WIHDQ

**I**F ALL started in June of last year, when W4HHK, Collierville, Tennessee, and W4AO, Falls Church, Virginia, spent an entire night trying to work one another on 144 Mc. There was a widespread tropospheric opening over the Middle West and South, and W4HHK was hearing W4AO's kilowatt c.w. a good part of the time. The lower power at the other end didn't quite make it, but both parties heard strong bursts of signal from time to time throughout the tests. From typical ham curiosity about those bursts came one of the outstanding v.h.f. stories of 1954.

Burst signals from several hundred miles away were not exactly a new phenomenon. They were reported in f.m. broadcast reception back in the early '40s. TV observers have been seeing fleeting glimpses of them for several years, and they have been noted on 50 and 144 Mc. many times. But what caused them? More important, could you catch enough of them at any one time to exchange information over a path of, say, 1000 miles, on 144 Mc.?

Nightly checks by W4HHK and W4AO showed that something could be heard over their 850-mile path consistently. Often it was nothing more than a few isolated "pings," but there *was* something. When W4AO was called away for a considerable period, W4HHK arranged schedules of a similar nature with W2UK, New Brunswick, N. J. This is a 940-mile path, with hilly terrain close to the northeastern end. W2UK's kilowatt, feeding a 40-element array, 85 feet above ground, was received by W4HHK on practically every schedule, morning and night, months on end.

If you read the fine print of this department regularly, you already know most of the story. Not only W4HHK, but W5RCI, Marks, Miss.,

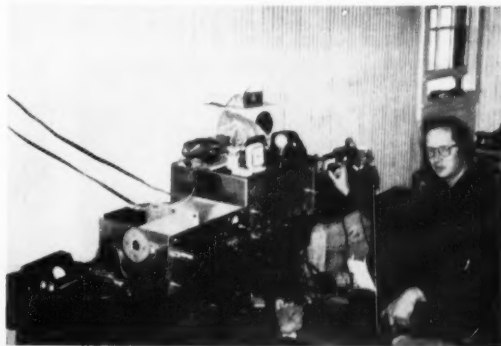
\* V.H.F. Editor, *QST*.

was able to hear W2UK, and when W2NLY, Oak Tree, N. J., and W2AZL, Plainfield, joined the project, their signals were also heard regularly. They weren't the sort of thing you'd want for a friendly rag-chew, but they were there, every try. Much of the time there was nothing more than 5 to 30 brief "pings" in a 5-minute test period, but other times there were longer bursts. Many lasted long enough to identify calls, and some ran to 30 seconds or more of readable signal, at times screamingly strong.

This called for a long-term program to see what could be done with the phenomenon. So, for over a year now they've been at it, at the expense of untold hours of sleep, and of the kind of hamming most fellows like to engage in. Tests were made at all hours, and occasionally right through the night when things looked promising. Reel after reel of tape recordings were made and studied, in itself a time-consuming operation. Various keying speeds were tried, including those high enough to necessitate transcribing from the tapes at half speed to copy what intelligence they contained. New and bigger antennas went up: 64 elements at W2UK, 48 at W2NLY, 28 at W2AZL, a huge cotton-field rhombic at W4HHK. Noise figures of converters were squeezed for the last fraction of a decibel. Transmitter powers were upped to the maximum legal limit. And skeds — skeds — and more skeds!

When W4HHK increased his power to close to a kilowatt and shifted his frequency to that used by the W2s, other 2-meter eaves-droppers, including your conductor, found that they, too, could hear the Tennessee signal. Listening whenever it was possible to do so, we found that W4HHK bursts can be heard at WIHDQ, 1020 miles, every time, and several other W1s have done equally well. W1KCS, Providence, R. I.,

World's highest 2-meter station? W6RLB operated from Pikes Peak, Colorado, July 31st and August 1st. Equipment included a 4X150A coaxial-line amplifier, delivering about 100 watts antenna power, two converters, a BC-342 and a collapsible 16-element array. Best DX was more than 600 miles.



1100 miles, is the most distant to date, but is obviously nowhere near the limit. If, as appears to be the case, these signals come through by reflection from ionized meteor trails in the *E* region of the ionosphere, they should be heard out to 1500 miles or so, at least.

Tests have been made whenever meteor show-ers have been in prospect, usually with only a slight enhancement in burst count or duration. An exciting period coincided with the arrival of the Perseid meteors, an annual meteor shower peaking around the middle of August. This was the prime meteor event of 1954, so extra sched-ules were set up to capitalize on it. Beginning August 7th, night and morning tests were made between W4HHK and W2UK, W2NLY, W2AZL and W1HDQ, whenever the working schedules of the various parties allowed. This called for W4HHK to be on the air by 0530 CST daily, but he was used to such things by then!

As the peak of the Perseids passed in mid-August, there were many more bursts recorded at both ends of the path, and more of them were of the sort that are useful for slipping across in-formation. By fast operating, plenty of repeats, and the use of special calling, signing and signal-reporting techniques developed to suit burst-type communication, two-way contacts were made by all hands. The first meteor-scatter two-way, be-tween W2UK and W4HHK, was reported several months ago, and the rest got theirs by Aug. 14th. More contacts should be coming up as other op-erators become interested in this special kind of game. October was a productive month in 1953.

During the Perseids period the signals were full of Doppler Effect "who-o-o-ps" and "yips" similar to those heard on lower frequencies when signals are bounced off meteor trails. The trouble in trying to communicate lies, apparently, in the fact that the ionization density required to bounce a 144-Mc. signal back is so great that it doesn't happen too often, nor last long enough to give us a usable signal in the normal sense. For the pur-pose of gathering data on a given path, trans-missions of 5 minutes or longer each way are help-ful. Keying speeds in excess of 20 w.p.m. are al-most a necessity, and A0 tests may yield slightly

higher burst counts than keying at moderate speeds.

For exchanging information enough to qualify the work as a QSO, various special techniques have been helpful. Between W1HDQ and W4HHK we've had good luck with one-minute transmissions, precisely timed, whenever there appears to be a chance of communication. W4HHK takes the even minutes (0530 to 0531, 0532 to 0533, etc.), the writer the odd ones. The first 15 seconds of each transmission is key down to aid in locating and checking tuning. This is followed by rapid call-and-sign, call-and-sign, for the balance of the minute. When a signal is heard the one who hears it then sends the same 15-second key-down period, but follows it with one call-and-sign and the signal report, repeated as many times as possible in the balance of the minute. If the other party gets the report he comes back with the key-down 15 seconds, then "R R R" repeated rapidly. The test can be concluded then, or it can be continued as long as desired, in this way, recording results as we go along.

The signals being essentially pulses, it becomes necessary to "pulse" the information, but useful data can be exchanged. While it is a far cry from ham rag-chewing techniques, it *is* communica-tion, and a mighty exciting (and often exasperat-ing) business, too! Signal reporting is based on length of bursts. Originally, an "R" report was given, as an adaptation of the RST system, but it has been superseded by "S," leaving "R" to be used solely as an acknowledgment of infor-mation received. Bursts of short duration, pings capable of carrying little or no information, are labeled S1. Bursts up to 15 seconds, with calls or parts thereof, complete letters and other information are given S2. A rating of 3 goes to bursts of 15 seconds to 2 minutes. A solid signal of more than 2 minutes calls for a day off to celebrate, and an S4 report. S5 — how optimistic can you get? When signals appear to run to long bursts one party may send information, followed by "BK." This is pushing one's luck, but it does work now and then, and is probably more satisfying to the average ham than the 1-minute-

Landing on the "stern and rockbound coast" of Todos Santos Island, K6AM identifies the expedition. Beside him is the island's lighthouse keeper, who ferried men and gear ashore. In the rear, W6POC and W6BYE pre-pare for hauling gear up the 40-foot bluff.



Personnel taking part in the expedition to Todos Santos Island. *Front row:* K6GGLG (with camera), W6BYE, W6MJ, K6BNW, W6NKL. *Rear:* W6POC (straw hat), W6COH, Skipper Bruce Osborn, W6BS, K6AM, and Cook Keith.



each-way technique. It is still well to keep closely to the one-minute schedule, even in shooting for instantaneous 2-way communication.

What does it take to turn the trick? Obviously, it's no game for the 522 addict. You have to have high power; the closer to a kilowatt the better. You need a good low-noise converter, working into a stable and selective communications receiver. (Stability, because you don't have time to fish for these signals; you have to set up your receiver and wait. Crystal filter selectivity of the medium order, for good signal-to-noise ratio.) A fairly large antenna is helpful, though good results are being achieved with arrays as small as the writer's 16-element job. You need schedules, set up precisely as to timing and frequency. And most of all, you need patience, and a willingness to take plenty of background noise on the eardrums. It's no casual sport, but the rewards are potentially high: new DX records, new states you never dreamed of working, and a chance to make a real contribution to scientific knowledge in a little-known field.

The work is attracting attention in scientific circles. A paper summarizing results to date, and tape recordings of typical signals, were prepared by the writer for presentation at the XIth General Assembly of the International Scientific Radio Union (URSI) that is to convene in the Netherlands just about as this appears in print. Much more information is needed, and you can help gather it. Burst counts, with precise timing and description, are wanted. Make tape recordings of results if you can. We need tests over shorter and longer paths, and in other directions. Off-path checks are of interest. Here is a chance to do an important job, gang. Let's go!

#### **Bursts from Lightning, Too!**

When we talk about bursts of the W1HHK-W1AO type, we must not confuse them with another kind of burst-type enhancement of v.h.f. signals that has been reported by observers for several years. This one has to do with lightning flashes.

One of the earliest to notice this effect, that we know of, was W3KUX, Washington, D. C., who discussed and checked it with W3GKP, Silver Spring, Md., some years ago. It has been noted several times this season, and a British magazine recently reported observation of it in TV work.

Sunset scene at the Todos Santos lighthouse. A 16-element 2-meter array was mounted on the lighthouse platform 100 feet above the rocks. Support in the background at the left was for a long-wire system used on 20, 40 and 75.

W9KLR, Rensselaer, Ind., heard it on the signal of W8WXXV, Shiloh, Ohio, during a thunderstorm Aug. 2nd. The two stations are about 240 miles apart. Bill was hearing W8WXXV at an S3 average, but on some lightning flashes his signal would rise to S8 to 9, an increase of 30 to 36 db. It sounded just like the meteor burst heard at greater distances, but the peaks were stronger than any meteor effects. Turning his array until the steady signal of W8WXXV could no longer be heard, it would still pop in for a word or two on some static crashes. W1UZZ reports strong bursts on W1YQL, a distance of only 100 miles.

The writer has heard the same effect on several occasions. The distances involved are not great enough to make possible any unusual contacts. Generally, it is a matter of 100 to 300 miles or so. Meteor effects, on the other hand, are seldom observed on signals closer than about 400 miles.

#### **Here and There on the V.H.F. Bands**

This could very well be our special "expedition issue" what with all the reports and pictures we have on hand. Pikes Peak with W6RLB #6; the Todos Santos Islands with XE6AM, Mr. Hoed in Washington and Marys Peak in Oregon with W7OKV 7 and W7JHP 7, Pensacola Beach, Fla., with W5RCL 4; Mt. Agamenticus in Maine with W1UZZ 1—these are just a few to choose from. Pack up, and come along!

The Pikes Peak operation was the first work on 144 Mc from that famous 14,100-foot summit that we've heard of. W6RLB is shown in our first photograph, at his improvised operating position in the bunkhouse. The rig ran up to 225 watts input to a 4X150A coaxial-line amplifier, c.w. only. Two converters, one crystal-controlled and one tunable, worked into a BC-342. The antenna was a 16-element collapsible array.

Gear was set up and ready to go at 2330 MST, July 30th, but though many calls were made that night, the first contact did not come until 0614 on the 31st. W6FXX, then at the key, raised W5VWU, Albuquerque, N. Mex., about 275 miles. At 0707 contact was made with W0EMS, Adair, Iowa, just under 600 miles, and the first Iowa-to-Colorado 2-meter work on record. Signals at this time were so strong that W0EMS almost passed them up for a local, but their automatic "CQ DX" caught his attention. W0UOP, Des Moines, and W0GUD, Conway, Iowa, were worked shortly after. W0UOP being the expedition's best DX, about 630 miles. Nothing more was heard until 0600 the following morning, when W5VWU 5, Sandia Crest, N. Mex., was raised. W5LEO 5, at the same location, came along two hours later, and that was it for the boys on Pikes Peak. No near-by stations were heard at any time.

The rig was set up for automatic keying, and was allowed to run continuously at times when no signals could be heard. W6RLB would greatly appreciate hearing from anyone who might have logged their signal.

No details are in from the other expeditions that were out the same week end. W6RLB reports that the White Mountain crew ran into trouble and never did get to the top of this 14,200-footer near Bishop, Calif. Some work was done from around 13,000 feet, but we don't know how they made

Packing up for the departure. Assistant lighthouse keeper watches, as W6NKK, W6BBS and W6BYE tie expedition gear to two-wheeled cart for the haul to the landing beach. XE6AM was first amateur operation from Todos Santos Islands, and first use of XE6 prefix.



out. And no word at all has come from the Mt. Whitney expedition, for which great things were planned.

The Todos Santos expedition was a de luxe affair promoted by W6COH, Van Nuys, Calif. Jim interested some of the San Diego gang, and eventually it became a joint project of the Los Angeles 2 Meter and Down Club and the Upper Ten V.H.F. Club of San Diego. W6COH obtained permission from Mexican officials to land on the islands and to operate from there. These rocky islands are about 12 miles offshore from Ensenada, Baja California, and 60 miles south of San Diego. There had been no hamming from there previously.

Transportation was furnished by Bruce Osborn, a yachtman of San Diego, who became interested in amateur radio when the v.h.f. men of that city provided communication for the Newport-to-Ensenada races. His 85-foot luxury yacht, the *Red Rooster*, carried the 11-man crew and gear with ease, but getting ashore and hauling the equipment to the operating position in the lighthouse was something else again. Seven round trips by rowboat by the lighthouse keeper were needed to land the gear and men. Then equipment had to be hauled up a 40-foot bluff, and toted by two-wheeled cart for three quarters of a mile.

The station was set up by moonlight, and some operating gotten in around midnight, Aug. 13th. All the following day they continued, working 109 different stations on 144 Mc., 114 and considerable DX on 20, and 40 contacts on 40 and 75. The station was dismantled early Sunday morning for the all-day trip back to San Diego. Two-way DX on 144 Mc. was the Santa Barbara area, though a report was received on 20 that the signal was heard in the San Francisco area. This has yet to be confirmed positively. The 2-meter rig was a 100-watt amplifier driven by a Gonset Communicator, feeding a 16-element vertical array mounted at the top of the lighthouse. QSLs are going out to all stations worked.

A new 10,000-Mc. record was the objective in the W7OKV-W7JIP work. These two fellows and their partners in crime had extended the record to 47.4 miles last April, and were looking for longer suitable paths. A visit to the Coast and Geodetic Survey office convinced them that the 109-mile shot from Timberline Lodge, Mt. Hood, to Marys Peak, near Corvallis, Oregon, was worth a try. There was not much to spare in regard to line of sight, the path figuring out to a scant 10 feet of clearance.

Equipment had been improved considerably over that used in the April work (more of this at a later date), enabling the stations to negotiate the greater distance. This time, signals varied all the way from S9, with complete receiver quieting, to complete fadeouts into the noise. Contact was maintained for 45 minutes. Liaison work over the path was conducted on 144 Mc. with Gonset Communicators. The one in use at W7JIP 7, shown in the photograph, was supplied and operated by W7BVV, who also provided the generator. The truck is owned by W7OAY. On hand with W7OKV 7 was W7BTF.

In case anyone would like to extend this 109-mile record, the boys are looking into paths of 200 to 250 miles for future reference. They also have some "high-power" klystrons that will put out 500 milliwatts, compared to the 20 or so delivered by the 723A Bs.

An expedition to put Florida on the 2-meter map was conducted by W5RCI the week of Aug. 15th. Taking an

## 2-METER STANDINGS

Call	States	Areas	Miles	Call	States	Areas	Miles
W1HID	19	6	1020	W6PJA	3	3	1390
W1RFU	18	7	1150	W6WSQ	3	3	1390
W1ZLY	16	6	750	W6RAZ	3	2	320
W1CCH	16	5	550	W6NLZ	3	2	247
W1AZK	14	5	650	W6MMU	2	2	240
W1MNF	14	5	600	W6GCG	2	2	210
W1RCS	14	5	580	W6JAC	2	2	200
W1RCS	14	5	540	W6EXH	2	2	193
W1DJK	13	5	520	W7JU	3	2	247
W1MMN	10	5	520	W7LEE	3	2	240
W2ORI	23	8	1000	W7YZU	3	2	240
W2IRK	23	7	1075	W7JUG	2	2	140
W2NLY	23	7	1050	W7RAP	2	1	165
W2AZL	21	7	1050	WSWXY	27	8	1000
W2QID	20	7	1020	WSBEQ	25	8	775
W2OPQ	19	6	800	WSWJH	25	8	775
W2PAT	16	6	740	WSRMH	20	8	690
W2DFV	15	5		WSWRN	20	8	670
W2AMJ	14	5	550	WSJDN	20	7	675
W2BLY	14	5	700	WSBAN	19	7	655
W2AOC	14	5	450	WSBP	18	7	800
W2QNZ	14	5	400	WSIKS	18	7	720
W2DWJ	14	5	425	WSRWV	17	7	630
W2UTH	13	7	880	WSWSE	16	7	830
W2SEK	13	6		WSRWV	16	7	790
W2ECT	13	5	405	WSRWV	16	7	790
W3RIE	23	8	950	W9HFW	23	7	725
W3NKM	19	7	660	W9VJ	22	8	850
W3KWL	16	7	720	W9EC	21	8	820
W3LNA	16	7	720	W9RPS	20	7	1000
W3PFI	16	7		W9ICH	20	7	750
W3HH	16	5	570	W9KLR	19	7	690
W3GAP	15	6	800	W9LE	19	7	800
W3TDF	13	5	570	W9ALU	17	7	530
W4HHK	26	8	1020	W9KPS	17	7	530
W4AO	22	7	950	W9WOK	17	6	600
W4JFV	18	7	830	W9ZB	17	6	660
W4KJL	16	7	665	W9MHI	16	7	660
W4ME	15	6	600	W9BOV	15	6	780
W4OXC	14	7	500	W9LEE	14	6	780
W4JHC	14	5	720	W9DDG	14	6	680
W4TCR	14	5	720	W9FAN	14	7	680
W4BY	14	5	435	W9DSP	14	5	700
W4IKZ	13	5	720	W9IDA	12	7	540
W4BEU	13	5	720	W9IDA	11	7	800
W4ZBU	10	5	800	W9FTA	11	5	540
W4IDQ	10	5	850	W9BFE	10	5	760
W4WCB	9	4	650	W0EMS	25	8	1175
W4TLA	7	4	850	W0GID	22	7	1065
W5RCI	20	7	925	W0HID	20	7	725
W5JTI	14	5	670	W0JNQ	17	6	1000
W5QNL	10	5	1400	W0INI	14	6	830
W5CVW	10	5	1180	W0JTB	12	7	1097
W5JTG	10	4	1260	W0IAC	12	5	725
W5MWW	9	4	570	W0WIZ	11	5	760
W5MI	9	3	700	VE3AB	20	8	890
W5AFN	9	3	780	VE3DR	17	6	790
W5IRD	8	3	570	VE3BQZ	14	7	900
W5VY	7	4		VE3DR	13	7	800
W5VY	7	3	1200	VE3BPA	12	6	715
W5FEK	7	2	580	VE3ACG	11	7	800
W5ONS	7	2	950	VE1QY	11	4	900
W6ZL	3	3	1400	VE2AOK	10	5	550

829B transmitter, a crystal-controlled converter and HRO, a collapsible 16-element array and a 40-foot telescoping tower, Rex and family took off for Pensacola Beach, Fla. Result: 144-Mc. QSOs with stations in Alabama, Tennessee, Louisiana and Mississippi, most of whom had never before heard a Florida station. Not the least of the results was the annexation of state No. 26 by W4HHK. The W5RCI 4 signal was audible at W4HHK, just under 400 miles, every night and morning during the week. This demonstration by W5RCI should bestir some of the hams around Pensacola to "get cracking" on 144 Mc.

Jumping up to the northeastern corner of the country, we report a trip to Mt. Agamenticus, near York, Maine, by W1U1Z. George was not able to get into operation until

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One end of the new 109-mile 10,000-Mc. record, Atop Marys Peak, near Corvallis, Oregon, W7JIP 7 (checked shirt) talks with W7OKV 7 on Mt. Hood. Left: W7OAY; right: W7BVV talks over the 2-meter liaison circuit.

**QST for**

# YL NEWS and VIEWS

BY ELEANOR WILSON,\* W1QON

## On XYLs, Too

It's heartening to learn of a club or a group of women who, though not necessarily coveting licenses of their own, nonetheless appreciate amateur radio and their licensed spouses enough to want to help them both in some way. The kind of interest and encouragement such women lend supports the hobby and results in personal harmony and happiness. More power to such XYLs! To use a trite but descriptive adjective so often lavished upon our YLs, we think the XYLs of amateur radio are "wonderful," too.

Upon realizing that about the only time the wives of members of the Evansville (Ind.) Amateur Radio Club ever saw each other was at the annual hamfest, W9MTF, Martha Young, introduced the idea of regular XYL meetings throughout the year. The idea "took" and has resulted in monthly get-togethers of the Amateur Radio Auxiliary of the Evansville Club for the past three years.<sup>1</sup>

Martha points out that the group plans purely social programs. Members are not induced to try for ham tickets but when interest is expressed, help with code and theory is readily available. Various projects have been undertaken for the purpose of building a treasury to help furnish a clubhouse for the OMs someday. The wives also aid in such activities as running the all-important food tent on Field Day, planning programs and prizes for the annual hamfest, assisting in civil defense drills, to mention a few. In all, a very satisfactory situation — contented XYLs and pleased OMs!

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The following YLs should be added to the list published here last month of those who

\*YL Editor, QST. Please send all contributions to W1QON's home address: 318 Fisher St., Walpole, Mass.

<sup>1</sup> A description of a similar group — the XYLs of members of the Southwest Missouri Amateur Radio Club — appeared in the April, 1952, column.

The multi-appendaged YL at the rear is not a member of the South African Women's Radio Club, but eleven of the more conventionally constructed YLs at her feet are Club members. During the SARI meeting at Johannesburg in April, the girls lunched together. Those members shown are (standing, l. to r.) Toni, ZS6YL; Olga, ZS6WT; Ina, ZS1NX; Mrs. D. Bennett; Cynthia; Yvonne, ZS6WV; Mrs. O. Gladwin; May, ZS6LK; Pearl, ZS6BP; (seated) Marie, ZS6KK; Theda, ZS6AQ; Miss T. Slavin; Anitra, ZS6AEU; and Diana, ZS6GH.

assisted with the 1954 All Women's Transcontinental Air Race: W4s TYU, YYJ; K6CPX; W6s NAZ, PJU, QPI, TDL, WRT and YZU.

— — — — —  
Make plans now to be available for the Fifteenth Annual YLRL Anniversary Party scheduled for Dec. 4th - 5th ('phone) and Dec. 11th - 12th (c.w.). Details next month.

## Nets Listed by YLRL

(New Fall and Winter Schedule)

### 'PHONE

Freq. (kc.)	Day	Time	NCS
3900	Wednesday	7:00 A.M. EST	W1VOS
3900	Wednesday	8:00 A.M. EST	W4HLF
3900	Wednesday	9:30 A.M. EST	W8ATB (W8HUX alt.)
3900	Monday	3:00 P.M. PST	W7HHH (W7SBS alt.)
3920	Wednesday	9:00 A.M. PST	W6PIF (W6QGX alt.)
14,240	Thursday	2:00 P.M. EST	W6HHA
28,900	First Tuesday of each month, at 9:00 P.M. EST (QRMary Net)		

### C.W.

3610	Wednesday	9:00 P.M. EST	W6JTX
7034	Tuesday	1:30 P.M. PST	W7ROA (W7RLH alt.)

Those interested in organizing other YL nets are invited to write to YLRL Vice-President W6KER, Gilda Shoble. It is not necessary to be a member of the YLRL in order to call into the nets listed above; all YLs are welcome.

## Keeping Up With the Girls

An apology to OM W3OP, Ed Knoll, of Slatington, Penna. In the August column W3OR was listed as holder of WAS/YL Certificate No. 5, when it should have been W3OP. Ed worked hard and long for the certificate, so credit is certainly due him. . . . VE3ERI, Judy Kennegeiser, is a new nine-year-old YL from North Bay, Ontario. Judy's mother is VE3DUZ and dad is VE3ACZ. . . . W5TTU, Pat, YLRL Fifth District chairman, has accepted appointment as chairman of the nominating committee under Pres. W6CEE, and W3SVY, Lorel, has been appointed advertising chairman. . . . From W9OMZ, Jeanne, comes word of the annual get-together of the Milwaukee Radio Club's Ladies' Auxiliary on May 21st and 22nd at the Medford Hotel in Milwaukee. A party, luncheon and banquet comprised the program which 55 enjoyed, including a number of OMs. Banquet speakers were W5ZUB, Verona; W8ATB, Esther; W9SJR, Bernice; and W0KJZ, Lydia. . . . Celebrating their first anniversary of continuous weekly operation, the Los Angeles YLRL's two-meter net met for a luncheon and swimming party at the Manhattan Beach home of W6LBO, Mary. Members present were W6s CEE, DXI JZA KYZ PJU QGX QQG WRT, K6s AC'F ANG, KN6s DRS and DRY. . . . Second call area YLs are invited to meet on 3900 kc. at 11:00 A.M. EST on the third

(Continued on page 146)







# Operating News



F. E. HANDY, WIBDI, Communications Mgr.  
R. L. WHITE, WIWFO, Asst. Comm. Mgr., C.W.  
PHIL SIMMONS, WIZDP, Communications Asst.

GEORGE HART, WINIM, Natl. Emerg. Coordinator  
ELLEN WHITE, WIYYM, Asst. Comm. Mgr., Phone  
LILLIAN M. SALTER, WIZJE, Administrative Aide

**October, Get in the SET.** By October most of us will have resumed our full stride in the year-round amateur activities, whether our choice is RTTY, experimenting, DX, traffic, or s.s.b. Nets by now should all be re-registered with ARRL to "make" the coming Net Directory and should now be at top-level performance, though perhaps still inviting in more representative stations to attain peak Section or Area coverage.

This is the month to check up on your individual registration—a matter for every amateur whether traffic or DX, whether v.h.f. or h.f., whether new or old-timer, to be signed up in the Amateur Radio Emergency Corps. Call your nearest ARRL Emergency Coordinator to get any news of local get-togethers and to ask about his plans. If not registered in AREC or RACES, ask for the forms to get lined up. The annual full list of ARRL Section Emergency Coordinators will appear in November of *QST*. Each October we suggest that each EC throughout the nation make the time one for annual roll call and to register amateurs newly in his group. In connection with SET, the Simulated Emergency Test goes beyond equipment testing as featured in the Field Day; it should get right down to brass tacks in applying operational and organizational deployment of amateur communications and RACES groups at the local levels. Going afield has high values, but the local application of our communication circuits to fill the gap in different simulated contingencies, while not having all the holiday aspects of FD, is the road to practical preparedness. The respect we carry as an institution of individuals dedicated to communicating capabilities will always be in proportion to our *performance*, and our ability

to demonstrate practical results in this emergency field. So October brings the call to get into this side of things, by enlistment, by participation, by co-operation, and by putting forward inquiries and suggestions as necessary to develop and further individual radio tests, under the auspices of designated local Radio Officers and ARRL Emergency Coordinators.

**Longest Message of the Month?** Stan Surber, W9NZZ, Peru, Indiana, carries on his skeds with the Arctic. In early August he got his longest message copied to date—a total of 2132 words—from one of the most northern isolated stations, two skeds being required to complete the traffic through QSB, QRM, etc.

**An Official Observer Suggests.** Few amateurs get to study signal and operating defects as thoroughly and consistently as ARRL Official Observers. It should help each of us to measure up to proper human standards of consideration, co-operation and friendliness in operating to study conditions and principles made evident in the report of Observer J. W. Geppert, W0CXE.

"The practice of leaving a transmitter on a frequency and then throwing it on the air the following day and whistling a CQ *without checking* as to whether the frequency is occupied seems far too much in vogue today. Those recently licensed seem inclined to be careful in this respect. Those more experienced, who have become careless in the points of operating care that mean so much to all, are urged to renew this consideration and courtesy. To do so always pays personal dividends in the friendship and regard of other amateurs!

"Overmodulation and disturbing side-splatter are also observed as too-common headaches to the OO and fraternity generally. Too many amateurs keep the gain up too high. When the peaks run more than 100 per cent it results in broken up, cracked up, indistinct modulation no longer confined to the 6 kc. near the signal frequency. This limits the use of the band by other amateurs, unless they quite properly call over the landline or drop a friendly postal card to the offender or even offer help in rectifying a situation caused by misunderstanding instead of deliberation. One amateur even wrote this observer asking 'what do you mean by a dummy antenna, and what is a monitor?' and yet this fellow goes on the air a lot. It is criminal to compliment stations when constructive criticism is in order, and misleading as well. Genuinely constructive criticism that results in consistent

## A.R.R.L. ACTIVITIES CALENDAR

Oct. 8th: CP Qualifying Run — W6OWP  
Oct. 9th-10th: Simulated Emergency Test  
Oct. 12th: CP Qualifying Run — W1AW  
Oct. 16th-17th: CD QSO Party (c.w.)  
Oct. 23rd-24th: CD QSO Party (phone)  
Nov. 6th: CP Qualifying Run — W6OWP  
Nov. 13th-14th, 20th-21st: Sweepstakes  
Nov. 17th: CP Qualifying Run — W1AW  
Dec. 4th: CP Qualifying Run — W6OWP  
Dec. 16th: CP Qualifying Run — W1AW  
Jan. 7th: CP Qualifying Run — W6OWP  
Jan. 8th-9th: V.H.F. Sweepstakes  
Jan. 8th-23rd: Novice Round-up  
Jan. 14th: CP Qualifying Run — W1AW  
Jan. 15th-16th: CD QSO Party (c.w.)  
Jan. 22nd-23rd: CD QSO Party (phone)

signal improvement makes the amateur receiving it a really superior 'citizen' and deserves his appreciation.

'Here are three of several possible points that could be included in an Oath for Amateur Radio Operators similar to the Oath of Hippocrates subscribed to in the medical fraternity:

(1) I will listen well on a frequency to see that it is clear before transmitting.

(2) I will check the frequency of my transmitter before going on the air.

(3) I will monitor my audio . . . and keying."

To live up to precepts one and three of The Amateur's Code, subscribed to also by those in the Royal Order of the Wouff Hong, an amateur as a minimum certainly will follow all operating practices in keeping with W0CXE's points. All our stations are dedicated to technical improvement and so ought to include break-in, push-to-talk, arrangement of operating controls to simplify and speed up operations, facilitate checks and reliable changes of frequency, and ability to check modulation without the presence of the signal on the air. So let's make it a point to wonder to ourselves if our personal operating *really* is the kind we admire in the other guy on the air, and set ourselves some goals to bring it to even higher standards than before! Operating improvement certainly can condone no such unintelligent practices as five-minute CQ calls without signing. Prime requirements are use of concise procedure, 'phonetics' only when really needed, use of proper ending signals and international abbreviations, and observance of complete message forms, procedures and self-disciplined circuit behavior meeting the top traditions that distinguish the two-way communicator from a mere broadcaster.

**Check on Your Ticket.** When starting fall operating it is a good time to check up on tickets, so many of which run out during '53. On renewals one must affirm active operation under one's license for at least *two hours* during the last three months of the license term, or *five hours* during the last twelve months of the license. Operating time is determined as the total of that accumulated in the log between the beginning and end of QSOs and may be either by voice or c.w. Active duty in the armed services may waive this activity requirement.

All renewals require only submission of the streamlined Form 405A, but if new or modified license as to address or other factor is required, get the longer FCC Form 610 application.

**BPL To Have Multi-Operator Category.** Effective next month the Brass Pounders League listing in *QST* will show a breakdown identifying the *more-than-one-operator stations*. This is just a reminder to all those who report traffic to be sure to indicate with their reports that the work all was individually handled on amateur frequencies where this is the case, and to identify a station report as to the number of operators concerned in handling of the reported traffic during the month when it is a multi-operator report.

All who handle traffic within the Field Organization Sections listed in *QST* are cordially invited to send a report at the end of each month, summarizing this work, direct to their SCM whose address is given on page 6. Any message totals reported, of course, should include only traffic handled on *amateur frequencies*, a matter of note for any station that has a dual status and changes frequency and call identity between CAP or MARS and amateur frequencies. Incidentally, handling traffic and reporting it to one's SCM is one of the best ways to gain know-how in terms of operating procedure, code speed and ability to take it down under adverse as well as ideal circumstances. It also immediately puts you in line with the SCM as one of his reliable stations, a likely prospect for official-station appointments. For those new to the traffic game let us add that the system for counting messages for report is explained fully in the booklet *Operating an Amateur Radio Station*. While 25¢ to non-members, all who are active within the ARRL fraternity may obtain this publication free on request.

— F. E. H.

## DX CENTURY CLUB AWARDS

### HONOR ROLL

W1FH	252	G2PL	247	W2BXA	241
W8HGW	251	W6AM	246	W4RPD	241
W6VFR	249	W3GHD	244	G6RH	241
W3HES	248	W3JTC	242	G6ZO	241
W0YXO	248	W3KT	242	W6MEK	240
W6ENV	247	W6SN	242	LU6DJX	240

### RADIOTELEPHONE

PY2CK	232	N1IAC	215	WINWO	212
W1FH	224	W8HGW	214	W0HRI	210
VQ4ERR	222	W1JCN	212	8M5KP	207
ZS6BW	216	W1MCW	212	W2APU	202

From July 15 to August 15, 1954, DXCC certificates and endorsements based on postwar contacts with 100-or-more countries have been issued by the ARRL Communications Department to the amateurs listed below.

### NEW MEMBERS

GZ7KP	160	I1BLE	108	PY1ANR	102
W9ZPT	136	Z1AJA	108	G3GAF	101
DL1JW	124	VE1ZZ	107	W6GFB	100
W6WVU	114	Y1ZAM	107	W5LY	100
W3ECR	112	YU3AB	103	W0NLY	100
LA4KD	110			G2FNB	100

### RADIOTELEPHONE

I1AJJ	107	W9ZPT	103	W0LHF	103
PY3DP	104			GZ7BC	100

### ENDORSEMENTS

W2WZ	231	W5BZT	162	W1CKU	120
W6RW	221	W9QIY	151	W3LEB	120
KZ5P	194	W6LDJ	147	F0SAP	120
W4RQ	190	W5LY	141	KP4JE	120
W6FW	180	W9CDI	135	W2JJC	115
W7HNG	180	G8PL	131	W3HUV	111
W0TKX	180	W2BBK	130	W5VIR	110
		PA0XE	124		

### RADIOTELEPHONE

W9RNX	160	W6GVM	131	H0QD	120
W0NCG	150	W3UIP	130	PY4AJD	111
KL7AFR	141	W4NYN	120	W2BRV	110

### CALL AREA LEADERS

W5MIS	238	W7AMX	236	VE4RO	221
		W9RBI	234		

### RADIOTELEPHONE

W3JNN	201	W6AM	195	W7HIA	175
W4EWY	172	W6DI	195	W0AIW	162
W5BGP	201			VE3KF	163



Elsewhere in this issue of *QST* you will find the announcement of the annual Simulated Emergency Test. Concurrent with receipt of this issue of *QST*, Emergency Coordinators should be receiving copies of the annual Simulated Emergency Test Bulletin. The SET date has appeared in the Activities Calendar since the issuance of June *QST* (in late May). The bulletin is not a notice that there will be a test, but a last-minute reminder and a conveyor of late information, if any, on who and what will be going on at national level; also to bring along reporting forms and point-scoring information.

Actually, the pattern will not be changed from previous years. The nominal week end for holding the exercise, when stations will be on looking for your traffic, is the week end of October 9th-10th. WIAW and other Connecticut stations will be covering the National Calling and Emergency Frequencies for headquarters traffic, and Red Cross sponsored stations will be on deck to do their part, as usual. Civil defense traffic will probably centralize at state or regional level, as last year. In addition, we're hoping the bulletin will carry all such information.

What we wanted to point out here is one added attraction this year: WIAW will carry a special simulated emergency message on most of the National Calling and Emergency Frequencies sometime during the week end. Its exact time of transmission will not be known, and its receipt will depend on the alertness of those monitoring the NCE frequencies. Those who receive the message and submit copies will get special *QST* mention. At this stage, details of the transmissions still have to be worked out. For now, suffice it to say that a TEA (Test Emergency Alert) will be transmitted from WIAW — and perhaps from other stations — during the SET week end, constituting an added attraction to our annual Simulated Emergency Test.

Hope you are planning to take part, OM! It's important to us that you do.

At approximately 1030, July 16th, an explosion occurred on the premises of the Kent Mfg. Co., Chestertown, Md., supposedly in the powder drying oven within the plant, which was engaged in the manufacturing of munitions for the armed services and of fireworks. There were several explosions, totally destroying a number of buildings. There were 10 known dead, 4 missing, and between 50 and 60 injured. The Maryland Emergency Phone Net swung into action with W3OHI as NCS shortly before noon and remained in action until shortly after midnight, when the emergency was declared to be over. At 1450 the FCC ordered that 3820 kc., and a band 10 kc. wide centered on that frequency, be declared a voluntary emergency frequency. This order was officially rescinded at 0006, July 17th.

W3ZA/mobile was in Centerville, Md., at the time of the disaster and provided the link into the MEPN in the early stages of operation, and was finally able to get into Chestertown. He forwarded many messages from the Red Cross to the net for delivery. In the early evening W3UQS/mobile

drove to Chestertown in order to relieve W3ZA. W3EQK/mobile also drove to Chestertown.

In addition to W3OHI, those participating in handling of net control were W3s NJT WEH PRL HWZ. There was considerable QRM on the frequency which made it difficult to read the mobiles from Chestertown. The prior formation of the emergency net and the experience acquired through repetitive drills in handling messages proved the effectiveness of such a net when it automatically went into action and produced such excellent results on this occasion. The response was automatic because this group had drilled for several years for such an occasion and was ready and willing to provide communication when it was badly needed. Practically every member stood by during the night to handle any traffic. Several W2s, as well as several members of the Pennsylvania Phone Net, including K2GMW and W3RSC, assisted when propagation conditions were unfavorable.

— W3PRL, SEC Md.-Del.-D. C.

On the evening of July 31st two storms of considerable intensity struck the Haverhill, Mass., area shortly before 1800. They were accompanied by very severe high twisting winds and severe lightning. The storm took down dozens of trees, high-voltage distribution lines, telephone cables and fire-box lines. The civil defense communications division was on duty shortly after 1800 and continued to function until after 0100. Mobile-to-mobile and mobile-to-base radio communications were carried on, using both city-owned and amateur-owned equipment. Some had roof-mounted speakers for p.a. work. Communications were provided between Auxiliary Police units at disaster points and the Auxiliary Police headquarters. WINAG patrolled parts of the city where the fire alarm department reported open fire-box circuits. Hams participating on an active or standby basis were: W1s FW TOY ZUB NAG QZS SNZ SIX RYV WTK UHH and LHT.

Operating under true emergency conditions was a rare opportunity and the efficiency with which so many disaster points were effectively covered resulted in praise and declarations from the c.d. director, Chief of the Auxiliary Police, Superintendent of Public Works, Chief of the Fire Department, and the local newspaper.

— W1CCF, Chief of CD Communications, Haverhill, Massachusetts

Amateurs in and around Austin, Texas, mostly members of the Austin Amateur Radio Club, were able to render considerable assistance recently during two raging forest fires in that area.

The first fire broke out on July 26th near Dodd City and burned on a six-mile front for two days. W5TFY was set up as local control station on 29.2 Mc., and his phone patch was used to good effect in handling traffic between the fire area and Austin. W5OEE, who put the loudest mobile signal back into Austin, was set up at a strategic point to serve as relay back to W5TFY, and as control for other mobiles at the scene. These latter were assigned to various firefighting units, and served as liaison among the various units, each of which had two-way equipment but on different frequencies. The amateur mobiles also patrolled the perimeter of the fire via back roads and reported to the Texas Dept. of Public Safety and the Travis County Sheriff's Department. About 80 per cent of the traffic was official, the other 20 per cent being personal traffic for the firefighters, plus news dispatches for the b.c. and TV stations. Total participation the first day ran about 14 hours, securing at 0600 on July 27th. At 1530 that afternoon, due to the advent of a high wind, several units were sent back to the scene for patrol work, but on this occasion the fire did not get out of control.

For the first time, the Fort Worth AREC participated in a simulated emergency test sponsored by Carswell Air Force Base. Casualty and medical reports were originated in the field and relayed to a command post at the Eagle Mountain National Guard Base via mobile units. The picture shows one of the mobile units in action with an Air Force officer at the mike while W5CVW operates the controls and W5UXQ looks on.



**QST for**

On July 29th another fire broke out about 10 miles away, near Jonestown, Texas. The Texas Department of Public Safety and the Texas Division of Defense and Disaster Relief called the Austin club to request assistance. The same gang went into action, and the club's 3-kw. power unit was taken along. W5ANQ was set up as control station with a rack-mounted rig in the back seat of his car. The generator, the rig and a ground-plane antenna made the set-up most acceptable for control purposes. Benefiting from past action, all units were in operation in jig time, even though there was an entirely new crew of officials to work with. Operation was very similar to that of the previous fire, except that very little personal traffic was handled. W5ANQ/5 laid a strong signal into Austin, making liaison with officials there perfect. When the operation was over, the fellows returned to town with cars full of ashes and lungs full of smoke. W5FXN, who reported all this, says his buggy still smells like the inside of a fireplace.

Thanks to a group of W6s who QSY'd off 29.2 Mc., when skip was on, to avoid interfering with the operation. W5FXN lists the following mobiles as having participated: W5s OEE OMP TQL ANQ PRO NXD QZZ RSA KNM FXN QDX VQU. W5TFY was the only fixed station. Much favorable publicity was received, most of it through TV and radio stations, for whom the Austin gang handled much traffic. A good two days' work, fellows.

On July 20th a vicious summer wind and rainstorm ripped Fort Wayne and northern Indiana. The wind velocity was estimated at up to 100 m.p.h. Damage consisted of downed power lines and uprooted trees. The power lines being out put the city into inky blackness, with even the traffic lights out. The uprooted trees blocked streets, opened gas and water mains, broke trolley and power lines and caved in homes and cars. About 25,000 telephones were put out of order. The storm hit the city about 1930 CDT. At 2030 W9UDD/9 was in operation at No. 1 Fire House, on the 10-meter 'phone net and mobiles started checking in.

The City Signal Department requested the following aid:

- locate and report obstructions of main arteries;
- check open routes to hospitals;
- report open routes in event of fire runs;
- check with auxiliary c.d. police on duty to see if traffic obstruction was reported;
- locate, investigate and report all downed wires;
- pick up and distribute warning flares to road blocks.

There were nets in operation on 29 and 14 Mc. Between 60 and 100 messages were handled. At net control the operators were W9s UDD QXF SWH KNT FXV and EOG. All these boys did a wonderful job. When net control had power failure W9SWH took over net control until power was restored. Stations participating were W9s UDD APW GPL NAI SWH CLZ BKJ BRW CXP BYR KNT NYK TDU LDL EOG QXF SNT HLY and BRN. At 2330 the call came through from the city Signal Department to fold up the net. A great big thank-you was given to all hands.

On July 22nd I was handed a letter from Robert Gaskill, Superintendent of the city Signal Service Department, thanking us for our job. This letter is placed in the club log.

— W9BEM, EC Allen County, Ind.

Thirteen SEC reports were received for June activities, representing 4087 AREC members. No new sections represented. This is an increase of one report over 1953's June record. Not bad; but then, not good. As of midyear, 23 different sections have reported 88 times. At this time last year, we had 77 reports from 21 different sections. The following sections are in the 100-percent column for 1954, up to and including June: W.N.Y., N.Y.C.-L.I., S. Dak., E. Bay, Los A., E. Fla., and Wis. The following have missed only one report: West Va., Nevada, N. Tex., and Tenn. Others who have reported this year: N. Mex., Mont., Ont., Alaska, W. Fla., Nebr., San Joaquin Valley, Georgia, Sask., Idaho, Md.-Del.-D.C., and Colo.

### ELECTION NOTICE

(To all ARRL members residing in the Sections listed below.)

You are hereby notified that an election for Section Communications Manager is about to be held in your respective Section. This notice supersedes previous notices.

Nominating petitions are solicited. The signatures of five or more ARRL full members of the Section concerned, in good standing, are required on each petition. No member shall sign more than one petition.

Each candidate for Section Communications Manager must have been a licensed amateur for at least two years and similarly a full member of the League for at least one continuous year immediately prior to his nomination.

Petitions must be in West Hartford, Conn., on or before noon on the closing dates specified. In cases where no valid nominating petitions were received in response to previous notices, the closing dates are set ahead to the dates given herewith. The complete name, address, and station call of the candidate should be included with the petition. It is advisable that eight or ten full-member signatures be obtained, since on checking names against Headquarters files, with no time to return invalid petitions for additions, a petition may be found invalid by reason of expiring memberships, individual signers uncertain or ignorant of their membership status, etc.

The following nomination form is suggested: (Signers will please add city and street addresses to facilitate checking membership.)

Communications Manager, ARRL. [place and date]  
38 La Salle Road, West Hartford, Conn.

We, the undersigned full members of the .....  
..... ARRL Section of the .....  
Division, hereby nominate .....  
as candidate for Section Communications Manager for this  
Section for the next two-year term of office.

Elections will take place immediately after the closing dates specified for receipt of nominating petitions. The ballots mailed from Headquarters to full members will list in alphabetical sequence the names of all eligible candidates.

You are urged to take the initiative and file nominating petitions immediately. This is your opportunity to put the man of your choice in office.

— F. E. Handy, Communications Manager

Section	Closing Date	SCM	Present Term Ends
Yukon *	Oct. 15, 1954	W. R. Williamson	Mar. 17, 1949
West Indies	Oct. 15, 1954	William Werner	Aug. 15, 1952
Utah	Oct. 15, 1954	Floyd L. Hinshaw	Feb. 18, 1954
Nebraska	Oct. 15, 1954	Floyd B. Campbell	Aug. 15, 1954
Arkansas	Oct. 15, 1954	Fred Ward	Aug. 16, 1954
Rhode Island	Oct. 15, 1954	Merrill D. Randall	Oct. 1, 1954
Saskatchewan *	Oct. 15, 1954	Harold R. Horn	Dec. 15, 1954
Hawaii	Nov. 15, 1954	James E. Keeler	Resigned
Colorado	Dec. 15, 1954	Karl Bruggeman	Feb. 16, 1955
Sacramento Valley	Dec. 15, 1954	Harold L. Lucero	Feb. 16, 1955
Michigan	Dec. 15, 1954	Fabian T. McAllister	Feb. 17, 1955
Minnesota	Dec. 15, 1954	Charles M. Bove	Feb. 17, 1955
Missouri	Dec. 15, 1954	C. L. Arundale	Mar. 1, 1955
Oregon	Dec. 15, 1954	John M. Carroll	Mar. 1, 1955
Manitoba *	Dec. 15, 1954	Leonard E. Cuff	Mar. 2, 1955
Mississippi	Dec. 15, 1954	Dr. A. R. Cortese	Mar. 8, 1955
British Columbia *	Jan. 14, 1955	Peter McIntyre	Mar. 13, 1955
Western			
Pennsylvania	Jan. 14, 1955	R. M. Heck	Mar. 17, 1955
Md.-Del.-D.C.	Jan. 14, 1955	Arthur W. Plummer	Mar. 21, 1955

\* In Canadian Sections nominating petitions for Section Managers must be addressed to Canadian Director Alex Reid, 169 Logan Ave., St. Lambert, Quebec. To be valid, petitions must be filed with him on or before closing dates named.

### ELECTION RESULTS

Valid petitions nominating a single candidate as Section Manager were filed by members in the following Sections, completing their election in accordance with regular League policy, each term of office starting on the date given.

Northern New Jersey	Lloyd H. Manamon, W2VQR	July 26, 1954
Nevada	Ray T. Warner, W7JU	Aug. 16, 1954
Kentucky	Robert E. Fields, W4BBI	Aug. 16, 1954
Canal Zone	Roger M. Howe, KZ5RM	Oct. 1, 1954
Santa Clara Valley	R. Paul Tibbs, W6WGO	Oct. 15, 1954

In the Montana Section of the Northwestern Division, Mr. Leslie E. Crouter, W7CT, Mr. Walter R. Marten, W7KUH, and Mr. Ralph L. Arthur, W7EWR, were nominated. Mr. Crouter received 52 votes, Mr. Marten received 47 votes, and Mr. Arthur received 36 votes. Mr. Crouter's term of office began Sept. 1, 1954.

## JULY CD QSO PARTIES

The number of whopping big scores shown below indicates just how popular the quarterly CD Parties are among ARRL appointees!

More such funfests are scheduled for the week ends of October 16th-17th (c.w.) and 23rd-24th (phone). Any holder of an ARRL appointment or office will be eligible to participate on both modes. If you're interested in organized operating activities and don't already hold an appointment, look over the list of them in the booklet *Operating an Amateur Radio Station* (sent free to League members upon request) or the *Handbook* and decide which best suits your particular qualifications. Then write to your SCM or the ARRL Communications Department for information on how to receive the appointment of your choosing.

Figures after each call indicate claimed score, number of contacts and number of ARRL sections worked. Final and complete results will appear in the October CD Bulletin.

C. W.		K2EHC	55,600-273-40
W6MUR	187,677-331-63	VEBZR	25,154-131-46
W4KFC	132,675-428-61	W8SDK	54,990-227-47
W4YHD	125,100-410-60	W7VII	53,760-140-42
W6JPH	108,585-381-57	W4ACJ	53,460-243-44
W4PSK	108,270-401-54	W4LAF	51,750-225-46
W1TYQ	97,625-355-55	K2FB	51,255-194-51
W7PCZ	95,004-203-52	W2HWH	50,550-226-45
W2ANG/2	92,960-327-56		
W1ZIP	92,950-331-55		
W4BZE	88,230-341-51	K2FB	16,740-117-27
W7CCB	87,516-187-52	W9KDV	13,775-95-29
W5TFB	86,435-288-59	W1CRW	11,500-92-25
W4YZC	84,000-329-50	W4NYN	10,625-85-25
W1RAN	78,175-289-53	W6UGA	9450-42-25
W1WPO	77,235-264-57	W2AEE	9375-75-25
W2IEP	73,920-301-48	W1MRP	8690-79-22
W4SAT/2	73,680-302-48	W8NOH	8525-70-23
W1EOH	72,630-262-54	W8ZXC	8505-63-27
W5DWT	71,775-254-55	W1RFE	8125-65-25
W1NFE	69,300-301-45	W1ZIO	8075-81-19
VE1ZZ	69,165-261-53	W4KMS	8000-80-20
W2COU	68,635-252-53	W1MNG	7700-72-20
W8NH	63,525-225-55	W3JZY	7470-77-18
W3QOR/3	61,805-259-47	W4PV	6930-72-18
W1EPE	61,710-242-51	W2LPI	6848-71-18
W9OKI	59,940-218-54	W1MX	6840-68-19
W1AW	58,750-228-50	W4LJ	6290-67-17
W8NOH	56,400-230-48	W3LMM	6090-54-21
W1WEE	55,965-267-41	W4TVO	6000-60-20

<sup>1</sup> W1VMW, opr. <sup>2</sup> W1WPR, opr. <sup>3</sup> W8CTS, opr. <sup>4</sup> W1S YFM  
Y8W, W9OHX, oprs.

## CODE-PROFICIENCY PROGRAM

Twice each month special transmissions are made to enable you to qualify for the ARRL Code Proficiency Certificate. The next qualifying run from W1AW will be made on October 12th at 2130 EST. Identical texts will be sent simultaneously by automatic transmitters on 1885, 3555, 7125, 14,100, 21,020, 52,000 and 145,000 kc. The next qualifying run from W6WHP only will be transmitted on October 8th at 2100 PST on 3590 and 7138 kc.

Any person may apply; neither ARRL membership nor an amateur license is required. Send copies of all qualifying runs to ARRL for grading, stating the call of the station you copied. If you qualify at one of the six speeds transmitted, 10 through 35 w.p.m., you will receive a certificate. If your initial qualification is for a speed below 35 w.p.m., you may try later for endorsement stickers.

Code-practice transmissions will be made from W1AW each evening at 2130 EST. Speeds are 15, 20, 25, 30 and

35 w.p.m. on Monday, Wednesday and Friday, and 5, 7½, 10 and 13 w.p.m. on Sunday, Tuesday, Thursday and Saturday. Approximately 10 minutes' practice is given at each speed. References to texts used on several of the transmissions are given below. These make it possible to check your copy. For practice purposes the order of words in each line of QST text sometimes is reversed.

Date	Subject of Practice Text from August QST
Oct. 1st:	Twenty-Five Watts Under the Dash, p. 10
Oct. 5th:	A Civil Defense Control-Station Transmitter, p. 16
Oct. 7th:	How to Tune a Single-Sideband Signal, p. 20
Oct. 13th:	Etched Circuitry for the Ham—Now!, p. 21
Oct. 19th:	The "Connecticut Kilowatt," p. 30
Oct. 22nd:	Some Checks on 10-Meter Mobile Whips, p. 34
Oct. 25th:	Let's Meet Mr. Ionosphere, p. 36
Oct. 28th:	Coast to Coast on 144 Mc., p. 62

## TRAFFIC TOPICS

Not so long ago, one of our traffic men pointed out to us that a friend of his who worked for the Post Office Department had told him that message delivery cards, if undeliverable, would not be returned to sender by the post office unless the return address and the pledge "Return Postage Guaranteed" were printed (not written, typed or stamped) on the address side of the card. This was news to us, and it raised the ugly prospect that we had been improperly advising our members all these years.

So we investigated. Inquiry at the Hartford post office failed to produce a decisive answer, so we wrote a letter to the Great White Father in Washington. We quote from part of the reply: "While it is preferable that the sender's pledge to pay return postage . . . be printed in ordinary printer's type, this is not required. Such pledge may be handstamped, handwritten or typewritten." So relax, fellows, if any of you have been worrying about this. The letter goes in our archives for future reference should the matter come up again.

The advent of BPL medallions has necessitated a redefining of Communications Department policy in regard to BPL listings. This is explained in full in the Operating News lead this month. We suggest that all interested traffic-flickers give it careful reading.

Traffic men should have plenty of work to do in the forthcoming Simulated Emergency Test. See the announcement elsewhere in this issue of QST. The long-haul phase is just one of several in the SET picture, but it is one in which our traffic nets can operate to best advantage. We suggest you plan now to operate your net in regular session over the October 9th-10th week end.

W8AMH reports a count of 620 messages in July on the Early Bird Net. On TCN (Transcontinental Relay Net), W3CVE reports July activities as 31 sessions, 3192 traffic total (averaging about 100 per session) by seven participating stations.

Have you registered your net? Better take care of it, OM!

National Traffic System. A fairly good crop of section nets is now reporting regularly for this column. We have been asked whether such reports are encouraged or merely tolerated. The answer is that of course they are encouraged, and any NTS section net manager who wishes to add his net's totals to the over-all NTS listing is urged to send us a report sometime before the fifteenth of the month.

We warned you that some day we would print a picture of W1NJM in "Traffic Topics" if you didn't come through with more pictures. Here it is, with W8UKV (on divan) and W2RTZ (who took picture) visiting. Exciters for 40 and 80 on the shelf, amplifier and modulator in rack to far right, just visible . . . about 500 watts input under full steam . . . walls and ceiling of shack almost completely covered by QSL cards. Well, you asked for it—gruesome, ain't it?

**QST for**





All we need is the month's traffic total (see March 1953 QST, page 68), the number of sessions, and the average per session. Regular NTS reporting forms are available if you want them.

The report to this headquarters for the NTS column should not be a substitute for reporting section net activity to your SCM. All we can use in this column are the figures; other data should go to your SCM for his section activities column. Remember, a section net is not an NTS section net unless it operates at NTS section level by sending a representative to all sessions of its NTS regional net.

#### July reports:

Net	Sessions	Traffic	Rate	Average	Representation (%)
EAN	22	489	0.58	22.0	96.9
PAN	20	407	0.33	20.0	72.5
1RN	22	288	0.46	13.0	94.2
2RN	22	135	0.18	6.3	93.9
3RN	22	105	0.29	4.8	92.4
4RN	44	102	0.23	2.0	39.1
RN5	19	146	—	7.7	45.5
RN7	53	355	—	6.7	32.6
8RN	18	81	—	4.5	79.6
9RN	32	237	0.52	7.4	49.2
TEN	71	1357	—	19.1	60.6
TRN	25	47	0.23	1.9	57.3
Sessions *	285	1746	—	6.1	—
Summary	655	5495	EAN	8.4	EAN
Record	655	6145	—	15.2	—

\* Section nets reporting: BAN (Calif.), LSN (Low A.), WSN (Wash.), CN (Conn.), AENB (Ala. c.w.), AENP (Ala. phone), QKS-QKS-SS (Kans.), WYN (W. Va.), Tenn. Summer, Minn. phone, ILN (Ill.).

WIOAK has earned her EAN certificate. W6UTV continues to report PAN activities. New 1RN certificates have been awarded to W1a UNG, TSZ VVA ZNQ CDX COC HRC SRM TVJ and WCG; July attendance included 39 different stations. An attendance record of 100 per cent on EAN was maintained by 2RN during July despite summer vacations; certificates have been issued to W2s ZRC IVU EMW IMU and K2BJS. RN5 is doing well on a reduced schedule. W7KZ has taken hold as RN7 manager. More representation from Indiana and Kentucky is needed by 9RN; only three times out of 32 for Indiana, none at all for Kentucky. VE3GI is taking over the reins of TRN managery from VE3BUR on October 1st.

The status of TCC is still a bit on the questionable side. In the Eastern Area there are very few vacancies, but plenty in the Central and Pacific Areas. Very few reports of TCC stations were received during July. Those who are holding the fort are amply demonstrating that it can be done, even in summertime. TCC directors are W6JZ (Pacific Area), W9FJ (Central Area) and W8UPB (Eastern Area). How about some of you Midwesterners and Far Westerners lending a hand? Write to your Area Director or ARRL Headquarters (WINJM) for details.

### IDEAS FOR YOUR CLUB

The Riverside Amateur Radio Club (Greenville, Miss.) in its August issue of *RARC News* indicates the club's intention to offer certain cups for the highest operating achievements in the club. A Novice WAS cup will be held by the Novice working WAS until another Novice wins it. There is a "Ramblin' R.F. Award" to be held each year, with the winner's name engraved for the 12-month accomplishment of that club member who gets the most out-of-state QSLs during each year. The club also issues a lively monthly bulletin, holds mobile transmitter hunts, and has other activities planned. On August 8th RARC conducted a competition (3885 kc., crystal or VFO) to determine which mobile had optimum field strength and pattern for its power input.

### W1AW OPERATING NOTE

The fall-winter W1AW operating and general contact schedule appeared on page 70 of September QST. See that issue for complete information on when and where to look for the ARRL Headquarters station.

### BRASS POUNDERS LEAGUE

Winners of BPL Certificates for July traffic:

Call	Orig.	Recd.	Rel.	Del.	Total
W3CUL	191	2564	2188	697	3640
KH6USA	45	1265	1265	45	2620
K8AIR	19	1195	1145	53	2412
W3WVQ	86	965	916	47	2014
W8SWP	45	855	701	145	1746
W7BA	22	859	826	31	1738
K6FDG	88	774	748	35	1645
K6FAE	27	703	686	18	1444
K6FVZ	51	668	642	26	1387
K4WAR	218	524	546	96	1384
W2JOA	82	661	515	109	1367
W8SCA	1	660	634	15	1310
W5MN	31	628	517	110	1286
KH6AJF	92	430	322	47	1091
W9DO	5	536	513	28	1082
W9JLJ	16	505	322	27	1070
W4USA	70	440	393	117	1020
W6PL	11	460	393	67	931
W7PGY	5	459	425	34	923
W9NZZ	289	314	3	310	916
K2EP	8	427	397	22	854
W7FRU	7	414	372	42	835
K6FCY	211	308	269	35	827
W6CAR	4	394	393	5	796
W8RJC	9	376	353	23	761
W2KEJ	29	354	262	94	739
W2KEV	6	361	340	21	728
W8RTA	22	347	312	24	705
W6ELQ	6	327	277	52	662
W6UW	173	89	302	93	657
W6LYG	12	317	207	110	646
K6FAM	22	317	243	31	613
W6CXY	8	299	258	41	606
W6QMO	32	289	222	60	603
W6PHI	23	289	231	54	597
W4WOG	12	279	277	1	569
W2JZ	17	272	140	130	559
W6GGG	12	265	239	22	538
W1UKO	13	246	226	19	504
W6HLI	14	250	229	11	504

Late Reports:					
W6IAB (June)	77	1735	1650	83	3545
W6VBZ (June)	124	744	635	123	1626
K6FAE (May)	17	733	733	19	1502
K6FVZ (June)	28	624	614	10	1276
W4USA (June)	65	560	540	83	1248
W7PGY (June)	9	569	485	84	1147
W2RO (June)	15	555	460	25	1075
W3USA (June)	38	438	337	135	948
W6LYG (June)	24	349	229	120	722
K6FAE (April)	0	317	299	20	636
W6CXY (June)	45	232	210	21	508
W4PJU (June)	2	252	201	51	506

BPL for 100 or more origination-plus deliveries:

Late Reports:					
K2FAV	279	W1VVA	107	W4VBA (June)	233
V606	259	K6WAY	106	W3CUE (June)	123
W8MLR	132	W6GIBJ	103	W8SAA (June)	121
W6USY	132	W8RO	102	W8UNJ (June)	112
W4DRD	109				

The BPL is open to all amateurs in the United States, Canada, Cuba, and U.S. possessions who report to their SCM a message total of 500 or more, or 100 or more origination-plus-deliveries for any calendar month. All messages must be handled on amateur frequencies, within 48 hours of receipt, in standard ARRL form.

### NATIONAL CALLING AND EMERGENCY FREQUENCIES

#### C. W. 'PHGNE

3550 kc. 14,050 kc.	3875 kc. 14,225 kc.
7100 kc. 21,050 kc.	7250 kc. 21,400 kc.
28,100 kc.	29,640 kc.

During periods of communications emergency these channels will be monitored for emergency traffic. At other times, these frequencies can be used as general calling frequencies to expedite general traffic movement between amateur stations. Emergency traffic has precedence. After contact has been made the frequency should be vacated immediately to accommodate other callers.

The following are the National Calling and Emergency Frequencies for Canada: c.w. 3535, 7050, 14,060; phone — 3765, 14,160, 28,250 kc.

### NATIONAL RTTY CALLING AND WORKING FREQUENCIES

3620 kc.	7140 kc.
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## Annual Simulated Emergency Test

(October 9th-10th)

A new "wrinkle" in the SET this year will be the transmission of a Test Emergency Alert (TEA) sometime during the week end of October 9th-10th. This is an added feature and does not take the place of any previous aspect of our annual SET. The transmission will be made by WIAW simultaneously by c.w. on the National Calling and Emergency Frequencies of 3550, 7100, 14,050 and 21,050 kc. at a speed of 18 w.p.m. It will also be transmitted simultaneously by phone on NCE frequencies 3875, 7250, 14,225 and 21,400 kc. Amateurs copying the transmission should dispatch messages to ARRL Headquarters, National Emergency Coordinator, noting time and frequency on which the message was copied. A copy of the message should be sent by mail. Those reporting reception and sending in copies will get special mention in the SET write-up in QST.

The exact time of the transmission, and whether or not it will be repeated more than once at different times, will not be announced. Your best chance of reception will be in monitoring the NCE frequency most likely to be open for WIAW at your location. Naturally, reception will be more difficult on the west coast, unless the "skip is on," in which case the east coast may have the most difficulty. Let's try the TEA this year and see how it works out.

The rest of the SET will be little changed from previous years. ECs, SECs, SCMs and affiliated clubs have received copies of the SET Bulletin outlining details and how to proceed. The bulletin is not an announcement of the test, but a last-minute reminder, including any late changes or additions to previously announced data. It will supersede this announcement.

Here's a run-down of how the SET works:

- 1) The EC calls a surprise alert of his AREC organization sometime during the week end of October 9th-10th (or other date if more convenient).
- 2) The group conducts a simulated emergency test under the EC's direction. The test may be slanted toward natural disaster (with Red Cross participation, if feasible) or civil defense (in coordination with local c.d. officials). During the test, each participant dispatches a message in standard ARRL form indicating his presence and availability, or anything else the EC directs.
- 3) The EC dispatches a message to ARRL Headquarters briefly describing the test and mentioning calls of participants.
- 4) The local Red Cross Disaster Chairman dispatches a message to the American National Red Cross in Washington, via amateur radio, reporting Red Cross participation in the test. This message should be solicited by the EC or someone designated by him.
- 5) The local Civil Defense Director dispatches an amateur radio message to his State Civil Defense Director, reporting civil defense participation in the test, if any. Again, the EC should solicit such a message. A list of state directors is included in the SET Bulletin. Coordinating this part of the exercise is a job for the SEC and state or section traffic and emergency nets.
- 6) After the test, the EC reports details on a form we will provide for that purpose.

Red Cross amateur stations W6CXO and W9DUA will be active on the NCE frequencies, as usual. There is some doubt as to the status of W3PZA (due to a projected move of QTH of American National Red Cross Hq.), but it is expected that if W3PZA is not active other Washington stations will be available to take Red Cross traffic. Civil defense traffic must stop at state level; due to a move of FCCA headquarters now in progress it has not been possible to set up necessary centralizing organization at the federal level. WIAW and other Connecticut amateurs will be on hand for receiving traffic addressed to ARRL. The Connecticut Net frequency (CN) is 3640; Conn. Phone Net on 3880, Virginia Net (VN) is on 3680 kc., Virginia Phone Net (VF) on 3835. The Md.-Del.-D.C. section net operates on 3650 kc., and the Maryland Emergency Phone Net on 3820. Most of these frequencies will be monitored.

(Continued on page 144)

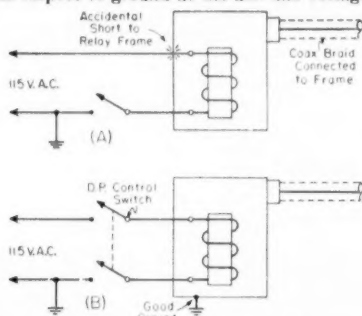
## Switch To Safety

Two tragic deaths that came about through amateur radio activities are recorded among this month's Silent Keys. Both were accidental electrocutions and both point up emphatically the need for all amateurs to observe full safety precautions in the pursuit of their hobby.

One fearsome lesson is learned from the unfortunate passing of **Richard A. Watson, WIWTD**, 35, of South Brewer, Maine. *Stay clear of utilities masts and wires when engaged in antenna work.* WIWTD either dared risk his life or did not know that 7000 volts was lurking above when he climbed a utilities pole, antenna wire coiled on arm, to anchor one end of his skywire. Death was instantaneous.

Fourteen-year-old **Mike G. Seiders, W5AIZ**, was killed in Austin, Texas, under a unique and unfortunate set of circumstances. Mike's backyard coax-fed dipole, "hot" with 115-volt a.c. line voltage, fell upon him while he was standing barefoot in a flower bed beneath it.

Had W5AIZ's shack ground connection been an effective one (cold-water pipe, for instance) a blown fuse would have indicated something awry during installation. Mike's metal-stake ground was of too high a resistance to cause this to happen. The set-up became lethal with these contributing factors: (1) The single-pole control switch for his 115-v. a.c. coax antenna relay was connected so that the "cold" side of the line, instead of the "hot" side, was opened; (2) the "hot" side of the line to the relay's coil inadvertently was in contact with the relay frame, causing it and the feed-line coax shield to be "hot" with respect to ground at the a.c. line voltage.



At (A), the lethal circuit encountered by W5AIZ. Hook-up (B) is proof against such a short-circuit introducing line voltage into the antenna system.

Lessons? There are several evident that are stressed periodically in QST and continuously in the Handbook: (1) Bond all shack equipment chassis, frames (relay frames included) and other "floating" metallic surfaces to a good ground. (2) Either make certain that all a.c.-line switches are in the "hot" sides of a.c. leads, or use double-pole switches that open both sides of the line. (Double-pole switches are much to be preferred

(Continued on page 128)

SCM AEC ORS CP GEC OBS TLS OO  
**Station Activities**  
 OBS ALOPR EC DXCC CLUBS RM OPS RCC

• All operating amateurs are invited to report to the SCM on the first of each month, covering station activities for the preceding month. Radio club news is also desired by SCMs for inclusion in these columns. The addresses of all SCMs will be found on page 6.

### ATLANTIC DIVISION

**EASTERN PENNSYLVANIA**—SCM, W. H. Wiand, W3BIP—SEC, IGW, RM: AXA, PAM: PYF, E. Pa. Net, 3610, 3850 kc. The Emergency Coordinator file of this office is in sad shape. Our SEC has been trying for the past year and a half to bring this file up to date with little or no results. Letters requesting information were mailed to all ECs with only one bringing results. It is felt that we have been more than fair in allowing this much time without cancelling a single appointment. This space is limited and should be used for items of interest to all but it is felt that this is the only way to put this final request on record and eliminate the possibility of further excuses. All ECs are requested to fill out a Form 5 report and mail it to this office. If this report is not received by Dec. 31, 1954, it will be assumed you no longer are interested and your appointment as EC will be cancelled. Anyone interested in learning the duties of an EC, turn to page 8 of *Operating an Amateur Radio Station*. The Pennsylvania Phone Net held its first annual picnic at Lancaster July 25th with 40 licensed amateurs and 68 XYLs, YLs, and jr. operators registering. GYI and TEJ attended the Virginia Phone Net picnic at Sky Top on the Sky Line Drive. ONA is back on the air after recuperating from a heart attack. Eastern Pennsylvania regrets the passing of GH, well known to many as the "Green Hornet." His enthusiasm for and contributions to amateur radio will always be remembered by his many friends. DUI reports three new Novice stations, ZKL, ZIP, and ZIP, with three more to follow, are planning a net in the Novice band. While working a little summer DX on 80 meters, UOE snagged F8FW/FC. ELI will be off the air for about 90 days while on a trip to Europe. LJ, presently active on 10-meter mobile, soon will be heard on other bands with his new all-band rig. PIJ, Abington Township ARA secretary and now serving in Uncle Sam's Army, reports several of the club members managed to get week-end leaves to participate in Field Day last June. Using the club's new memorial call, PSH/3, six operators manned an Elmac transmitter on all bands to work a total of 304 stations. OQG is back in the States after serving 19 months in Korea with the Army. Traffic: (July) W3CUL 5640, BFF 366, RSC 67, UOE 59, TEJ 58, VNJ 42, OZY 40, NOK 36, PYF 36, LJ 34, TTW 33, UWP 28, YJM 22, GYI 18, GES 12, PVY 10, BES 7, DUI 7, ZLI 6, WQL 3, ELI 1. (June) W3RSC 90, PYF 32, RXW 28, TEJ 28, TTW 24, VN 22, UOE 17, UWP 14, GYI 13, VKW 10, BES 3.

**MARYLAND-DELAWARE-DISTRICT OF COLUMBIA**—SCM, Arthur W. Plummer, W3EQK—July 16th was a red-letter day in the life of EQR, who received a telephone call and visit from YSIFM, Fred Mejia, of San Salvador, Republic of El Salvador. VLL broke the top whip section of his WEB-WIP Bandpanner mobile antenna recently. He now is the only licensed amateur operator for K3MCR, the local United States Marine Corps Reserve outfit. NNX's vacation took him to Yellowstone National Park. EEB will be QRTing to get the new Johnny HKS is reporting into 3RN while the MDD Net is closed for the summer. RV now has open wire folded dipole on 80, vertical folded dipole for 10, and another vertical for 40 meters. The Andrews Electronics Assn. soon will have its own club quarters on the base. This is because Colonel Elkins, Commanding Officer of this Air Base, recognizes the capabilities and qualities of ham radio operators, as well as the potentialities of ham radio in general. LDD reports SZOG has become Asst. EC for Aberdeen to replace

7UPW, who was transferred to Monmouth. 9BUB received his Army discharge and returned to his home in Illinois. 2YAY, 3WVK, 3LDD, 3VER, 3SZY, 5YWA, 5ZOG, 8CPN, 9OKI and 9MNZ handled 12 messages successfully during the June 14th C.D. Test in Aberdeen. Your SCM would like to thank LDD for the following. "The editorial of yours in QST about the radio gang in Aberdeen resulted in 5 new members for the APG Radio Club. They never even knew it existed although we participated in Armed Forces Day, C.D. Alert, and Field Day. All are in the Army but all their information came from QST so keep up the good work." The APG Radio Club's officers are 18CF, pres.; 9BMN, vice-pres.; and Bill Wheeler, secy-treas. NNX, who is connected with b.c. station WFBR, was one of the first to know of the munitions plant explosion at Chestertown, Md., and received permission from his boss to go to his home and alert the Maryland Emergency Phone Net for traffic handling. Phil got OHI in D.C. and ADQ in Bushwood, Md., together and EQK mobile, heard the goings on and chimed in. Later UF in Annapolis, Md., got in with UQS, a mobile in that area, who eventually crossed the Chesapeake Bay Bridge in order to relay from 3ZA, the only mobile in the Chestertown Area. ZA was at c.d. headquarters in Centerville but because all roads were closed he was unable to get into Chestertown for quite some time. MCD in Dover, Del., also was available on the frequency while ECP in Washington, D. C., did yeoman service trying to keep 3815-3825 kc. open for emergency traffic. The explosion occurred about 10:30 a.m. and NNX had started to alert the net by 12:20 p.m. At 2:50 p.m. the Washington office of the FCC issued an official edict declaring 3820 kc. and 5 kc. either side an emergency traffic frequency. The MEPN picnic, held at Gambrill's State Park near Frederick, Md., was attended by 375 hams, XYLs, and jr. operators. Y.A., our genial and well-liked Atlantic Division Director, attended with Mrs. Crossley and son Ed. The chief auctioneer was OMN, president of the Rock Creek Amateur Radio Assn., ably assisted by GA, also a member of RCARA and officer of the MEPN. RVL's XYL, Betty, is now operating as UMC. They both are using a Windom and doing pretty well on 20-meter phone. The Washington Mobile Radio Club will hold a banquet in October. Watch for the date! Members of the 11 clubs in and around Washington, D. C., will hold a meeting soon to form an inter-club council mainly to coordinate their activities. AEA has 32 members. IQMW has been transferred overseas. YQI also has been transferred but three new members have been gained by the acceptance of W3YQZ, K6ARZ/3, and G. A. Powers, jr., whose Novice ticket is en route. 4VXJ is on temporary duty in Greenland. The BARCS recently elected F.V. pres.; JNM, vice-pres.; KIDJ, treas.; and PSP, secy. Lis. CDQ, recently met Fred, YSIFM—original QSO, 1926! WRH has just finished wiring his Johnson II and is active on the MARS net. If you work a KLT and hear a familiar voice it may well be 3PZW. Incidentally, another member of the Young family, ole WV, can be heard nightly on 10 meters in contact with PKC, handling traffic between Washington and Baltimore. OTC has moved to a new QTH. The Potomac Valley Radio Club, operating 4KFC at Bumpass, Va., recently worked 1218 stations with 3 transmitters. Fourteen operators participated. EEB is wiring up a new Johnson Ranger. QQS reports a big time was had by all on Field Day at Fort Washington. The CARC of Towson has the following programs scheduled: Sept. 13—Speaker: Dr. W. B. Lanning—Topic: How to Read and Use the Curves in Tube Manuals. Sept. 27—Speakers: Messrs. Wm. H. Miller and Louis E. Susenbitt—Topic: Fire Insurance Regulations and the Amateur. Congratulations to MAZ on the fine weekly c.d. drill he and his group conduct in Northern Baltimore. And, oh yes, see RKK for information about burnt-out tubes and grid drive! Traffic: (July) W3WY 178, EEB 177, NNX 10, June W3USA 948, CVE 218, EEB 23, ECP 30, NNX 6.

**SOUTHERN NEW JERSEY**—SCM, Herbert C. Brooks, K2BG—PAM: ZL K2FB/W3NF, at Phillipsburg, has been mobile this summer. Ed also is NCS on EAN one night each week. Most traffic-handlers report too much hot weather for their business. ZL has been ORS since 1922 and has reported activities promptly each month. A very fine record. K3ZINQ is a new YL. Moorehead, Peggy is UA's daughter. The Burlington County Radio Club expects to have its club station in regular operation soon with newly-built equipment and the addition of several new mobile stations. Sorry to hear that YPQ had an accident. Hope you recover quickly. Pat. OWA is planning a trip West this summer and expects to operate 10 meters on the way. 8UG, at Milford, is a new ORS. Bill is not a new traffic-handler but an old-timer coming back. "Seutlebut" reports the Hamilton Twp. Radio Assn. had quite a Field Day. Congratulations

to "Bunny," Trenton's youngest YL on receiving her General Class ticket. Also, congrats to K2IQS on getting his General. K2ART is operating portable from Camp Columbus. VMX, Ventnor City, expects to change his QTH to the Camden Area in September. Charlie has been doing a good job as OO. ORA, Collingwood, keeps me well posted with his OES report each month. Keep the reports coming in, fellows, they are needed to keep this column going. The NIN Traffic Net meets regularly Mon. through Sat. on 3595 kc. Also look for N. J. Civil Defense Net (c.w.) on 3505.5 kc. Sun. nights with RG as Net Control. K2CPR has just returned from FFS-Land where he operated FFSAA July 9th to 16th, inclusive. Traffic: W2RG 111, K2FB 64, W2ASG 30, K2BG 23, W2ZI 9, K2CPR 3, W2HAI 3.

**WESTERN NEW YORK**—SCM, Edward G. Graf, W2SJV—Asst. SCM, Jeanne Walker, 2BTH, SEC: UTH/FRL, RM: RUF, PAM: GSS, NAL, NYS meets on 3515 kc. at 6:30 p.m. on 3525 kc. at 7 p.m.; NYS meets on 3595 kc. at 7 p.m. Mon., Tue., Wed., Fri., and at 4:30 p.m. on Sat.; NYS C.D. meets on 3509.5 and 3593 kc. at 9 a.m. Sun. EMU returned from a vacation in New England and VE2-Land to find his antennas had been lowered by the painters so is QRT for a time. RHQ received OTC certificate. He is going strong on 432 and 230 Mc. K2DYB has Heath VFL and VFO. RXW is home after two trips to the hospital and is recovering gradually. DVE QNIED NYS on 7/3 from Penn. State Forest using 32 volts to 110-volt rotary converter off 16 with 2-volt batteries for power. The antenna was up 60 feet. QHH has 5-band WAS and YLCC/300. HNN is back on 2 meters after an absence of 3 years. He and QNA have 55-ft. telescoping towers. QQ and family vacationed in VE3-Land. THU, now located in New Jersey, vacationed in the Buffalo Area and visited as many hams as possible. SYT changed QTH to Batavia. SJV visited the SEC, UTH, and was shown the new QTH Hank acquired at Victor, consisting of 23 acres for antennas and a 12-room house on top of a hill. The Rochester Mobile Club invited the Greater Buffalo Mobile Club to a joint meeting and family picnic at Letchworth State Park. K2FAY makes BPL on organizations. The Erie County C.D. Test proved successful according to state officials. WS is active again in traffic work, especially from overseas, using a three-element beam on 20 meters. Appointments: K2DYB as ORS, K2AHH as OPS, RHQ as OES. Renewals: EMW as ORS, TQ as EC for Clinton County. Syracuse and Onondaga County Chapter of American Red Cross is making facilities and licensed amateurs available on the last Wednesday of each month for Novice and Technician Class exams. Prospective should contact the Syracuse Red Cross for details. NYS certificates have been issued to CXM, ANE, DXV, WXZ, and K2s DSR and AHH. The SRP birthday party was held at Gerard's, near Albany, on July 4th. UNF wrote an excellent poem for the anniversary. K2DSR received 30-w.p.m. Code Proficiency certificate. Traffic: (July) W2RF 399, W8 300, K2FAY 279, 156, DSR 121, W2QH 110, K2DXV 103, W2ZRB 70, HKA 59, K2CUQ 39, W2BNC 32, COU 32, JMT 27, SJV 20, RUT 17, OZR 10, RQF 10, DVE 8, EMW 3. (June) W2RJ 10.

**WESTERN PENNSYLVANIA**—SCM, R. M. Heck, W3NCD—SEC: GEG, RM: UHN, NUG, GEG, PAM: AER, LXE/VKD, AFV, our most active OO, reports that AER has been released from the hospital. We are happy to hear it and wish Chris a speedy recovery. SJB reports neatly skeds with SUK on 220 Mc. LQQ, McKean County EC, holds AREC drills on 3525 kc. at 9 a.m. Sun. The McKean Radio Club elected OBL, pres.; SJV, vice-pres.; and MEY, secy.-treas. UHM and NKM are new mobiles from SCARC. RIK is back on 10 meters. A new baby girl, Linda Lee, makes a proud papa of VRL. UUI recently operated portable W2 from Wildwood, N. J. The SCARC reports a very fine Field Day. The following Washington County Amateur Radio Club members recently attended the hamfest held at South Park by the SHRP&M: IDO, NRE, VEM, SUK, NQM, UFI, UHN, OEO, CRA, WJF, VFN, and Kenny Wilcox. The RAE Hamfest held recently was a great success and attended by many Tri-State amateurs. STR heads the educational committee of the RAE. PIV has a new jr. operator. NXX has been assigned a CAP call. QHH and his XYL enjoyed vacationing in the New England States. Eric mobiles returning from c.d. practice drills were able to call ambulance and police aid for persons suffering an unfortunate auto accident. Those participating in the drill were NRL, MED, KVB, STK, NXX, QN, TMK, OIE, and UQG. The Mercer County Radio Association stand-bys have been putting in a busy summer attending all nearby hamfests and taking time for a fine club picnic at Yankee Lake where a goodly number, by all, including XYLs and the kiddies. Traffic: W3WU 201Y, Y 89, TSX 74, UHN 53, VKD 50, SJJ 36, UTR 13, KNQ 8, KUN 6, RVS 1.

## CENTRAL DIVISION

**ILLINOIS**—SCM, George Schreiber, W9YIX—Section Notes: ILM (325 kc.), IEN (3840 kc.), SEC: HJA, RM: BUK, MRQ, PAM: UQT, EC Cook County: HPG. Some of the leaders of IEN, including UQT, the PAM, are revising the membership rules of the net with a view to increasing efficiency. TLC divides his time between 75 meters and bass fishing. ZEN likes 40 meters and boat

building. ZJZ designed a new miniature receiver for model airplane control. NIU and HPJ talked things over at the APCO Convention at Pittsburgh. CEE has taken a permanent job at KSB 47, the Illinois State Police c.w. station at Chicago. He replaced CGP, who requested transfer to Pontiac. DO again is high traffic man in Illinois and well on his way to getting the traffic medallion. EU spent his vacation in Canada without a radio but got in plenty of fishing. QJZ says he worked harder at home on his vacation than he ever did at the salt mine. KH is a new EC at McLeansboro and concedes traffic-handling honors to the XYL, PNK. New calls in the section are IAX, IHK, IJU, and Novice IHS. HUX has moved and now commutes 27 miles to work daily. What a mobile opportunity! LMC spent the summer at camp but returned loaded for traffic-handling on ILM. OLN also returned from camp to home QTH. SKR wound 130 feet of wire on a bamboo pole and promises a report on the results next month. OKI has returned to Eureka College. DRN is proud of working Minnesota and South Dakota on 144 Mc. and Ohio on 220 Mc., as well he might be. UVM has joined the mobile ranks, as has RQR. We regretfully report the death of QJY (Carol Bixby) former secretary of the St. Clair Amateur Radio Club, in a speedboat accident in Northern Michigan. A Q has left Scott AFB for Arizona and MWT has left for an unreported destination. When K2DE, BYR, and BA get together on the air it is three brothers in QSO. WPY spent a long vacation in W6-Land visiting some of the hams he works on 20 and 10 meters. LXJ and IYL have new jr. operators. LXJ, as well as other Illinois hams, have been kept busy giving examinations under the new FCC rules. DPK keeps skeds with his dad, HYK, who is 81. PVS scrapped his 120-Mc. antenna and has advanced ideas for a new one. New members reporting into ILM are VTO, VSN, UZE, and VER. LGR, formerly of Illinois, but now of Wisconsin, visited her sister, VER, and talked to some of the old gang. NOO has been getting his family settled in Athens, Ga. Wonder what has become of the DX feud between NN and EU? Please examine the dates on your appointments as we have started a survey of the files with a view to speeding out deadwood. Traffic: W9DO 1982, SME 150, IDA 129, OKI 107, LXJ 80, USA 78, PNK 72, MRQ 47, CEE 43, YIX 35, UHD 32, OKQ 25, RLX 22, BUK 15, W6CIW 9 15, W9UVM 10, PHE 6, LMC 5, FRP 2, WAX 2.

**INDIANA**—SCM, George H. Graue, W9BKJ—Over 800 Hoosiers turned out for the IRCC annual picnic at Frankfort Park on July 18th. There were 320 registrations and many fine prizes. Indiana's highest award was received by NZZ. The Novice award was presented to W9ZTN. The Field Day Contest award was won by the Ft. Wayne RC with a score of 2196. Evansville TARS was second with 2076. IFN, on 3910 kc., had 31 morning and 22 evening sessions. Total traffic was 174. RFN total traffic was 81. JBQ has done much to swell the ranks of RFN along the Ohio River. MAM and MIV are OPS appointees. JJJ and NZZ made the BPL. KLR has 19 states on 2 meters. HXK and TJN are heard again after long absences. BFW and QUI operated from the Tipton County Fair. BEM is new EC for Ft. Wayne and Allen County. BOC has been exploring catfish holes along White River East Fork with WHL. MTV, FLO, and CXP vacationed at Lake James. 31WX, ex-9CXV, vacationed at his old QTH and at Dallas Lake. Ex-9WMM now is HJZ. W9HMS is brokeback for the NKPR. CTA is now in Ft. Wayne. Ex-4VMX is ITC. IJC and EJC are new in Peru. IMB is new at Gilead. AB will add a 2-meter transmitter. TARS has AREC drills on Mon. and has a trailer equipped with all gear and 3-kw. generator. More than 25,000 people were without services in Ft. Wayne when the worst storm in the city's history struck a wide area at 7 p.m. on July 20th. Twenty mobiles established fire and hospital routes and diverted traffic around obstructions. This 10-Meter Net included UDD, APW, GPL, NAH, SWH, CLZ, BKJ, BRW, BYR, CXP, KNT, NYK, TDU, LDL, EOG, QXF, STN, HLY, and BRN. On July 31st when a windstorm struck the Pendleton Area, a number of Hoosiers stood by on 3910 kc. ANJ has a new jr. operator. WIB had a new receiver that didn't work. MHH had a W8 call until it was corrected to read W9. Congratulations to Indiana's all-time family. The OM is YDA, the mother is PAZ, the son, age 12, is ZSM, and the daughter, age 11, is HRE. At this writing BKJ and his XYL are enjoying L.A. and sunny California, and FMJ is preparing the report. Traffic: W9JU 1070, NZZ 916, QYQ 150, CMT 71, WRO 59, NTA 58, KDV 55, DOK 53, OFW 50, VNV 36, SVL 33, ERB 30, HRW 28, DKR 19, CC 17, YIP 14, QR 6, BDP 5, NH 3, YVS 2.

**WISCONSIN**—SCM, René W. W9RQM—SEC: OVO, PAM: ESJ, GMY, RM: UNJ, NTE: BEN, 3950 kc. 6 p.m. daily; WPM, 3625 kc. 6 p.m. daily; WPN, 3950 kc. 12:15 p.m. Mon.-Sat., 9:30 a.m. Sun. State mobile and c.d. frequency: 29,620 kc. With another BPL this month, CXV needs only August to qualify for an ARRL Medallion. WWJ is completing 4-125A 500-watt rig. RTP is using new Heathkit VFO. NUC operated mobile/VE while in YNO and his mobile back in operation. YLE has new double 813 final. SDR was active in the July CD Party. MRAC members VIK, EKI, MOT, MDG, WYJ, BPR, MGT, RRS, WAN, WYH, VBZ, and 2BDV handled communications for the Soap Box Derby. UFX has 100-watt 829B rig on 144 Mc., and is building a 32-elic



ment beam. ZAD has 11 states, 5 call areas, with best DX of 700 miles on 144 Mc. LEE, skeds LJV at 0735, 08BN at 0800, followed by IMQ daily on 144 Mc. Wisconsin has had an almost perfect attendance record on 9RN sessions. WZK spent the summer working as a disc jockey at WSPt. The WPN June report shows 107 participating stations. AER purchased a new Globe King transmitter. ZDM is debugging the new Viking II after disposing of his Globe Scout to ZDH. YAY fired up the 220-Mc. exciter and plans 832A final into corner reflector. WAN has a new antenna with improved results. The Browning Club ran 7 transmitters from 5-kw. generator in Field Day. J8E is now in La-Crosse. New officers of the Milwaukee School of Engineering Club (HHX) are ZCK, pres.; VCH, vice-pres.; FOY, secy.; SCH, trustee. ZVK is active on 3.5 Mc. VCH is active in 5th Army MARS. GUE has mobile installed in new '98'. Olds. RKP's DX score now reads 118 worked and 104 confirmed. DIK has Viking II and 853A. June and July meetings of the WVRA featured talks on TV by JBF. New appointments: REQ as EC, SZR as ORS. Appointments endorsed: IQW as ORS, LAG and SAA as EC, UNJ as RM. Traffic: (July) W9CXY 606, V6W 371, WJJ 272, SAA 94, RTP 77, UNJ 67, IQW 36, SZR 31, ZAD 18, RQK 17, LSR 14, OVO 7, AFT 6, GMY 6, YLE 6, RQM 5, SDK 3, AEM 2. (June) W9LSR 5.

## DAKOTA DIVISION

**NORTH DAKOTA** — SCM, Earl C. Kirkeby, W0HNV — The annual North Dakota Hamboree was a grand success, with over 300 hams present. The Viking II first prize went to DQB, of Mayville. The second prize, an NC-88, went to TAX, of Ulen. The Midwest Teenage Net has moved to 3900 kc. (8:00 a.m.). EBA has a new Ranger. OVG, who lost all his new equipment in a fire that destroyed his store and home, has a new NC-88 and Ranger and is back on the air. GH has moved to Bismarck for a while. New on the air this month (July) are W9WVC, at Fargo, and W0UTM, at Neebe. Traffic: W0KPL 141, EBA 52, RTZ 39, EXO 28, OWY 24, NRP 22, HNV 20, BFM 8, KZZ 8.

**SOUTH DAKOTA** — SCM, J. W. Sikorski, W0RRN — Asst. SCMs: Earl Shirley, 0YQR, and Martha Shirley, 0ZWL. SECs: GCB, RM, a new NC-88, PAMs: PRL and NEJ. The SFAIRC held a meeting at the Naval Reserve and inspected a radar installation there. ORE worked eight new states on 144 Mc. during July. RRN has a Viking mobile. Ex-9HUI is back in Yankton and has received his old call, 9HFE. GWH, formerly of Sioux Falls, has moved from Noyes, Minn., to Portal, N. D. New calls: N0VMF and N0VMG, Mitchell; VMM and VMV, Huron; N0VMH, Vermilion. CSD purchased a Viking from LCM, Worthington. Fewer reports were received this month than for any month in the last two years. How about some help? The c.w. net for June had 13 sessions, 54 QNI, traffic 31. Traffic: W0MPQ 32, PHR 23, SCT 17, QKV 15, BLZ 11, FFP 8, SMV 7, LBS 6, RWE 3, GWS 1.

**MINNESOTA** — SCM, Charles M. Boye, W0MXC — Asst. SCMs: Vince Smythe, 0GCS, SEC, GTX, and OMC, DQL. PAM: JLF. CGV, KOEA's wife, Gladys, now has a Novice license, W0NMF. The son will be back in Bemidji. MVJ is now on the air with 'phone as well as c.w. The Mobile Amateur Radio Corps of Hennepin County had about 25 mobiles participating in the Minneapolis Aquatennial. They formed the link in communications between Aquatennial Headquarters and the various activities. The St. Paul boys who handled the communications at Keller Golf Club for the annual tournament of the Professional Golfers' Association really chalked up some records for themselves and for ham radio in general. Altogether they sent 4668 separate messages, contributed 558 man hours of time, used about \$2000.00 worth of equipment, and got 132 words of newspaper publicity. They used 6 and 10 meters, a Viking II running 30 watts as the main control station, 4 pack sets, and 2 hand sets. They were assigned 35 general passes, 23 working passes, and 4 emergency passes. Everybody showed up on time for his regular trick. There was much praise for the care that went into the planning and the efficiency with which they carried out their assignments. The St. Paul Mobile Radio Club has set a high standard of service in this public operation, certainly fulfilling the three precepts of our licenses — interest, convenience, and necessity. CYJ and FFW spent their vacation in Germany visiting German ham stations. BUO made 50 contacts by mobile on his 10-day vacation. YTL is in the hospital for a while. DQL attended the Denver Hamfest. KJZ has been elected vice-president of the St. Paul Radio Club, Inc. TQQ is a new ham up near ELY. Traffic: W0KJZ 144, UCV 84, KFN 76, KNR 63, TRX 46, MVJ 42, LST 35, NBD 33, OJH 31, BCO 29, LUX 29, GTX 28, QZK 26, EQS 20, CHD 19, TUS 17, TXQ 16, EYW 14, RA 10, KCF 9, KYG 9, NTV 7, ABA 6, FIT 6, HAH 5, OPA 4.

## DELTA DIVISION

**ARKANSAS** — SCM, Fred E. Ward, W5LUX — This will be my last report and I want to thank all for the nice cooperation received the past two years. Let's all get busy and help the new SCMs. He will need our reports each month and all the assistance we can give. There are quite a

number of EC renewals and appointments this month. VQD is EC for Monroe, WUM for Grant, TLC for Perry, HEE for Jefferson, and TTD for Faulkner County. EYD, EMN, and ENG are new calls at Batesville. BNA is moving to Clinton, S. C., and will be head of the Psychology Department of a college there. YAE is building a RW1 rig using 4-400A final. NLL has been appointed PAM for next other year. Les has done a nice job with the 'phone net the past year.

**LOUISIANA** — SCM, Thomas J. Morgavi, W5FMO — WN5EDQ, with a group of Boy Scouts, left for International Falls, Canada. Skeds are planned each evening with WNS, EDK, and ETV on the 80-meter Novice band. DGH and YAD are looking for recruits to their Mid-South Teen-Age C.W. Net which meets on 3719 kc., the 1st and 3rd Sun. at 1400 CST. MXQ won the Viking II at the Columbia, Miss., hamfest. On the a.s.b. front, ZSP is on with a 10A exciter and an 811 final. ABS is building an 811 p.p. linear. FYZ is on with a home-brewed rig with 150 watts on peaks. MWE reports into nets on a.s.b. ZNI will be on a.s.b. soon. OTD won the mobile station grand prize at the Jackson hamfest. OFT has been transferred by the Navy to sea duty. The Westside ARC had an emergency drill with ABD as NC at the Algiers courthouse and mobiles VUH, KOQ, BUK, VVZ, UDL, JCC and WCJ being dispatched to their respective shelters. Messages were received at the Red Cross center at New Orleans with UQK operating the station, using the Greater New Orleans ARC call CK/3. New officers of the Westside ARC are NYC, pres.; VVZ, vice-pres.; JCC, treas.; BUK, act. mgr. WN5PVL's Novice exam was the first that NG gave. WN5DUU passed his General Class exam. Those wishing to start a c.w. net or interested in ORS appointments should contact the RM, NG. Fellows interested in 'phone activities, OPS, OBS, and 'phone nets should contact the PAM, HED. DHT and QMB have new jr. operators. KHX is now a DX hound with his new vest pocket beam. USN will give Novice exams in the New Orleans Area when requested. Traffic: (July) W5NG 303, NDV 104, FMO 52, (June) W5KRX 146.

**MISSISSIPPI** — SCM, Dr. A. R. Cortese, W5OTD — Well, gang, all the hamfests here in Mississippi are over for a while. Jackson, Columbus, and Greenville put on swell events and I know all enjoyed them. Keep up the good work, and let's have bigger and better ones. The Greenville Club puts out a fine news letter, and is to be congratulated. YBH, WDY, and YXZ are at Miss. State now. YBF is a new OPS. JHS, in Gulfport, is monitoring 29.6 Mc. at all times for the mobile gang. CUU is on a.s.b. now. TAK is new EC for Jackson. Now that fall is in the air let's get the MENS back in operation. Get out those keys and get busy. We would like to have more reports from Novice operators. What are you newcomers doing? KHB is taking applications for AREC membership, as are your local ECs. Traffic: (July) W5EWE 62, RNB 26, TIR 22, RIM 19, OTD 15, YXZ 9. (June) K5FGJ 218.

**TENNESSEE** — SCM, Harry C. Simpson, W4SFC — SEC: RRV. RM: WQW. PAM: PFP. Three hundred hams enjoyed the Memphis Fest, thanks to the splendid arrangements made by Memphis Club Presy YMB and his fine staff. New ECs include BQG, FWX, VQE, VVG, UZY, WAX, and WQX. Nearly all counties have ECs. Interested persons should contact RRV quickly. VJ is sporting new Extra Class license. His many friends will be glad to hear that PL is up and active again. VJ missed no sessions of TN this month. Posies to Route Manager WQW for efficient handling of the summer c.w. net. The Oak Ridge Club beat out the Knoxville Club in Field Day competition. The Bays Mountain Club plans to set up a joint TVI committee with the Kingsport Club. UO reports the East Tennessee 'Phone Net operating smoothly, with heavy traffic and good participation. The Net meets an hour earlier than the regular 'phone net because of the time zone. SGU, APD, ZJY, and PVD operated PVD during the CD Party. PVD has received 9 new confirmations, bringing his DX total to 33. WQW toured East Tennessee, visited HHH, RRV, and UVS, and later attended the Memphis Hamfest with LC and EXR. FEI, HCU, LJU, and QAN again are mobile with new rigs. SCF's son received Novice HUT. 2- vs 6-meter operation for the State Emergency Net is a big topic for discussion at the moment. Traffic: W4OGG 538, IIB 186, SCF 128, PFP 124, TYU 113, YMB 84, TZI 61, WQW 57, BG 42, AFB 33, SON 26, BAO 23, HHH 20, RET 20, GZC 12, UWA 11, RRV 16, VJ 15, WQJ 12, RMJ 10, SUH 8, DCH 6, FLW 6, PVD 3.

## GREAT LAKES DIVISION

**KENTUCKY** — SCM, Robert E. Fields, W4SBI — MWX again is reporting into the KYN after a round of VYI and late working hours. He now has the drive back on the air with about 75 watts (BC-457) and no complaints to date. CDA has completed his 20-meter rig out of left-overs from TVing his former rig. He is thinking about studying A-3 emission and trying 'phone sometime. NBY still is trying for an EC for each county in Kentucky. WNH is working very faithfully for WAS, but still needs Utah. JCN has finished building a Viking II and reports that he is getting the same results as with his former 500-watt rig.

(Continued on page 80)





# Announcing an exciting new contest!

## BECOME AN HONORARY NATIONAL ENGINEER!

In a very real sense, our company has always been **your** company. We've always tried to be a valuable friend of amateur radio and short wave listening. We've designed and built our products to meet **your** needs and desires.

To dramatize your big role in our company, we'd like to make you an official "Honorary National Engineer".

We're going to run a contest and here's how it works.

Simply send us a suggestion you'd like included in your "dream receiver". The suggestion can be technical or non-technical — anything from a complete circuit design to the styling of a tuning knob or a practical way to cut cost and price. Your suggestion is limited only by your imagination.

**Each month**, an independent panel of judges will select the best suggestion

and the winner will receive a brand-new NC-88. He will also be eligible to win the Grand Prize of a complete \$1,000 radio shack (including a Johnson Viking II transmitter with semi-automatic key, a National HRO Sixty with matching speaker, an Astatic microphone and a Telrex rotary antenna!) if his suggestion is judged best of all out of the winning monthly entries.

Even if you don't win, you'll get a handsome scroll certifying that you are an "Official Honorary National Engineer"!

Your National distributor has official entry blanks now.\* Hurry and get one — start having fun with your "dream receiver"! Entries for this month's contest must be postmarked no later than midnight, October 24.

*tuned to tomorrow*



# National

NATIONAL COMPANY, INC., 61 SHERMAN ST., MALDEN 48, MASS.

\*If there is no National distributor near you write direct to the company, attention Contest Dept. I.



*The Rumors ARE TRUE—*  
*there's* **BIG NEWS—**  
**A New SUPER BANDMASTER TRANSMITTER**  
**—TVI SUPPRESSED—**

*The Midget with a Mighty*  
**No. T-90**  
**90** WATTS CW  
**75** WATTS PHONE  
*Only*  
 12<sup>3</sup>/<sub>8</sub>" x 10<sup>1</sup>/<sub>2</sub>" x 6<sup>3</sup>/<sub>4</sub>"  
**\$179.50\***

Factory built and Tested  
 complete with tubes  
 less power supply  
 (NOT A KIT)



The T-90 is the result of our long study concerning the operating requirements of most amateurs. Sufficient power to "get out" on all bands, either fixed or mobile, under today's QRM conditions, plus space limitations of the average home, has been the prime objective in its design. The many refinements contributing to smooth and efficient operation which have been incorporated in the T-90, have up to this time been found only in transmitters selling at a much higher price. A close study of the following features will provide convincing evidence that the T-90 is the transmitter YOU WANT for your shack or car.

**FEATURES**

1. TVI Suppressed
2. Complete band-switching; no plug-in coils
3. Complete Break-in Keying — or keying of exciter stages only
4. VFO Spot Frequency Tuning without carrier on
5. Cathode biased Exciter tubes and clamp tube control of Final Amplifier Screen Voltage
6. Initial tuning at reduced power
7. Three position excitation control
8. Antenna loading flexibility
9. Selector switch allows metering of PA Grid, PA Cathode and Modulator currents
10. Remote Break-in and Receiver muting provided by relay control
11. VFO voltage regulated and temperature compensated
12. Illuminated VFO dial and Meter
13. Crystal door on front panel
14. Filament Operation 6 or 12 volts AC/DC
15. Low average Modulator current
16. Built-in provision for either Carbon, Crystal or Dynamic microphone and push-to-talk

**NOW IN PRODUCTION SEE YOUR DEALER**

*Send for Complete Technical Details to*

**Harvey-WELLS ELECTRONICS, INC.**

from *Harvey*-WELLS!!!!

and a DOUBLE CONVERSION MATCHING RECEIVER

— WITH HIGH SELECTIVITY —

*Packed with Performance on*  
**EVERY BAND**

**No. R-9**



**9 TUBES**

**MOBILE  
OR FIXED**

*Same Size  
cabinet as  
Transmitter*

**\$149<sup>50</sup>\***

**SPEAKER IN MATCHING  
CABINET AVAILABLE**

In our further studies of amateur requirements, we found that the ultimate desire of all was to have equipment which "went together". The difficulty of installing odd sizes of cabinets has always been a source of irritation to the neat and efficient operator. The R-9 is physically an identical twin to the T-90. Now at last without any reservation you can have fixed station performance either in your shack or in your car. This highly stable all-band double conversion receiver has a versatility and a number of refinements which have never before been offered in such small space.

#### **FEATURES**

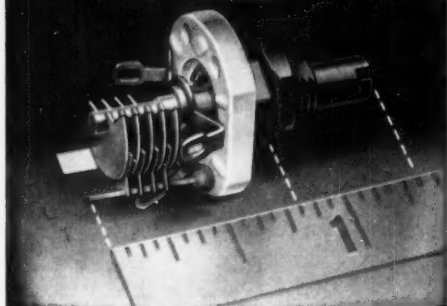
1. Double conversion on all bands
2. Three tuned circuits on each band, in R.F. section
3. All coils slug tuned, giving high "Q" circuits
4. Separate oscillator coils for each band (no spurious response)
5. Bandwidth:  
Two kilocycles wide at the 6 db point
6. Complete with tubes and your choice of built-in power supply for 6-12 V. DC or 115 V 50/60 cycles AC
7. Crystal control for net operations
8. Approximately 6" of dial spread on all bands. Accurately calibrated
9. Rigid Steel construction, (Vibration-Proof)
10. 6" height enables easy under dash mounting for mobile installation

**NOW IN PRODUCTION SEE YOUR DEALER**

\*Prices subject to change without notice.

**SOUTHBRIDGE, MASSACHUSETTS, U.S.A.**

# "LITTLE MAC" does a big job!



## Ideal trimmer for VHF range

To keep pace with the continuing efforts of the electronic industry toward miniaturization of components, Hammarlund has introduced a tiny variable capacitor, type "MAC". This component provides the low minimum capacity essential for use as a trimmer in the VHF range.

The silicone-treated base is only  $\frac{3}{4} \times \frac{5}{8}$  inches. Its rotor and stator are soldered assemblies of brass, nickel-plated for low losses, while the wiper rotor contact is nickel-plated beryllium-copper. Rotor and stator terminals are positioned to permit short leads. A threaded bearing is provided with flat sides to permit single-hole mounting without turning.

The new units are available to fulfill capacity requirements between 1.4 and 19.6 mmf. Try one in your next piece of gear.



If you haven't received your copy of the Capacitor Catalog, write to The Hammarlund Mfg. Co., Inc., 460 W. 34th St., New York 1, N. Y. Ask for Bulletin C10.

# HAMMARLUND

(Continued from page 75)

WXL visited ZLK, SZL, and TQC. KKG reports that he has been getting most of his traffic on 15 meters. NVR has decided to join the MARS gang in Kentucky. KKW really is doing a fine job as RM, and with fall and winter coming on he really will go to town. A report from the SEC states that he has about 25 ECs now and most of them are mobile. Watch for alerts on the KFN 3945 kc. at any time (no dates given). SBI has been having trouble with community TV system and has not been too active on the air. Traffic: WAKKW 152, WNH 77, ZLK 74, VBA 59, JCN 30, MWX 30, SBI 28, WXL 27, NIZ 19, KKG 11, AZQ 10, CDA 8.

**MICHIGAN** — SCM, Fabian T. McAllister, W8HKT — Asst. SCMs: Bob Cooper, 8AQA (phone); Joe Beljan, 8SCW (c.w.). SEC: GJH. Thanks, fellows, for the many AREC applications being received. We try to process and forward them to the County ECs the same day as received, and the membership cards should follow shortly thereafter. Vacation season is in full swing and several of the gang have forwarded their reports right from the vacation spots. QIX left early in the month; EGI left for a camping trip in the U.P. and Canada, and says he is taking no radio this trip. RAE went to Montana, and will do a bit of fishing in the Bear Tooth Mountains. FLA spent nearly a month in the East and now is sporting a new Viking with 1700 Pikes were in the news this month, too. At the BR/MEN gathering at Alma the membership elected LNE as net manager, MMN as vice-pres., and AQA as secy-treas. NEJ will manage the U.P. Net, with NEK as secy-treas. The Blossomland picnic was well attended. The v.h.f. picnic at Allegan drew many 2-meter enthusiasts from Illinois, Indiana, and Wisconsin, in addition to our own crowd. EYI was chairman, with NOH assisting. The U.P. boys deserve a great deal of credit for their work in setting up and arranging the shack for JPJ, a bed-ridden ham. The Kalamazoo Area AREC boys are going strong under EDN, and they have enjoyed splendid cooperation from the Sheriff's Department and the Red Cross. FGB and SCN are sporting new Viking Rangers, and they are real enthusiastic over the performance. SCW says the regular work, plus the ten acres, doesn't leave much time for loafing this time of year. We know just what you mean, Joe! WYL got in on his first CD Party and had a whale of a time. KXS writes from Naples, where he is stationed with the Navy. He expects to be back in eighteen months, and sent in his AREC application to prove it! Traffic: (July) W8HJC 761, MLR 271, FN 139, ILP 123, ELW 110, NOH 96, WKO 96, NUL 88, JKN 71, NTC 47, ZLK 46, QIX 39, SAW 31, IV 29, QGO 26, HSG 20, HKT 18, TQP 18, DAP 16, WYL 10, QGH 9, DSE 7, EGI 4. (June) W8SCW 59, RTN 19, SJF 18, BRV 2, HSG 2.

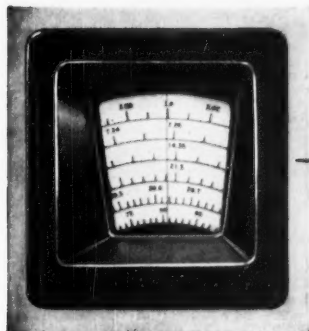
**OHIO** — SCM, John E. Slinger, W8AJW — Asst. SCMs: J. C. Erickson, 8DAE, and W. B. Davis, 8JNF. SEC: UPB, RMs: DAIE, FYO. Newly-appointed ORs are DQG, MQQ, and REL. RO now has two legs on the new BPL medalion award by making BPL for the second straight month. New Ohio initiates in 8RN are DQG, LHV, and MQQ. 8G/8 took part in Field Day with FLN, QCO, LVP, LVK, ZCW, GDB, FCA, FEQ, and MRN taking part. The Licking Co. Emergency Corps did a commendable job during the recent storm which destroyed most of the telephone and electric systems in the area. FYY, LVP, LVK, LFN, GDB, and FEQ performed yeoman service and the group was lauded by the county sheriff and the mayor of Newark. A new ARRL affiliate is the Toledo Mobile Radio Assn. Over 100 families attended the CACARC picnic at Roundup Lake. BF and his bride were feted by the CWA and local DX enthusiasts on July 31st. The Findlay Hamfest was held Sept. 5th. The Rag Chewers picnic at Hinkley produced a nice turnout. JNF, Asst. SCM, spoke on behalf of the League at this affair. BZD found the VE3 boys a very friendly and hospitable group during his recent vacation near Georgian Bay. The OCARC has acquired a loving cup to be awarded to the winning member group in the last ARRL 88 Contest. HNP, Lucas County EC, appeared on two TV programs and told about the amateur's place in civil defense communications. APC has a Viking II transmitter. GZ, our de luxe OO, worked 53 countries in 8 a.m.s.e. in 18 days. HHL reports he has 11 Toledo mobiles. HHF, JKS, VQP, CIX, VTZ, WIT, TWD, HNF, YOG, SMS, and MBE formed a caravan, operated on 160 meters and set forth for Fremont. Fixed Fremont stations in contact with the 11 Toledo mobiles included YFJ, HRN, JBO, IZE, TCA, and ONT. All mobiles qualified for the SVARC certificate. JBI has confirmed his 200th country. EWB recently received his 'phone 1XCC, which was accomplished in less than a year with all operation on 20 meters. Springfield's Q-5 reports that 30 amateurs attended Field Day operation and a total of 302 contacts were made. The group operated on 2, 20, 40, and 80 meters. Eastern Ohio Ham Flashers states that the Conneaut Radio Club meets monthly at Kingsville Airport on U. S. Route 20. GYY is operating aboard the Str. Voorhees on the Great Lakes this summer. AIW and WC are back in Conneaut after wintering in Florida. DXO has control of the 29.5-Mc. net during Operation Alert in the Mahoning County Area; the MVARA held its Field Day at Austintown Park and racked up over 400 contacts on 75-meter 'phone and 40-meter c.w. HDC's NYL received her Novice Class li-

(Continued on page 82)



## THE HQ-140-X...

# BRINGS 'EM IN — AND KEEPS 'EM IN!



BANDSPREAD DIAL



HQ-140-X

Once you bring in a signal on your HQ-140-X communications receiver, you will continue to hear it until you change the setting. That's because the HQ-140-X has an extremely low frequency drift — less than .01% after a 15-minute warm-up. And that's over the full range, from 540 Kc to 31 Mc, too.

This is one of the reasons the HQ-140-X is preferred by Hams. It's the amateur

receiver built to professional standards. These professional standards include little extras in design, circuitry and construction not normally found in an amateur receiver.

The extras show up in performance. In addition to its excellent stability the HQ-140-X receiver gives you:

**EXTREME SELECTIVITY** — sharp signal separation even in the most crowded bands.

**LOW NOISE LEVEL** — a noise limiter that really works.

**RUGGED CONSTRUCTION** — built to "take it" for many years.

Investigate the many extras offered by the HQ-140-X. It's available as a cabinet model or for rack mounting. For complete details, write to The Hammarlund Manufacturing Co., Inc., 460 West 34th Street, New York 1, N. Y. Ask for Bulletin R-70.

### THE HQ-140-X IN ACTION...

#### CIVIL DEFENSE

Because of its dependability, the HQ-140-X is the receiver used by many local amateur groups for civil defense as well as other emergency use. Consider it as the communications receiver for your CD operations.



# HAMMARLUND

SINCE 1910

## Heathkit GRID DIP METER KIT



MODEL GD-1B

**\$19.50** Ship. Wt.  
4 lbs.

with additional blank dials for individual calibration. You'll like the ready convenience and smart appearance of this kit with its baked enamel panel and crackle finish cabinet.

The invaluable instrument for all Ham. Numerous applications such as pre-tuning, neutralization, locating parasitics, correcting TVI, adjusting antennas, design procedures, etc. Receiver applications include measuring C, L and Q of components—determining RF circuit resonant frequencies.

Covers 80, 40, 20, 11, 10, 6, 2, and 1 1/2 meter Ham bands. Complete frequency coverage from 2-250 Mc. using ready-wound plug-in coils provided with the kit. Accessory coil kit, Part 341-A at \$3.00 extends low frequency range to 350 Kc. Dial correlation curves furnished.

Compact construction, one-hand operation, AC transformer output, variable sensitivity control, thumb wheel drive, and direct reading calibrations. Precalibrated dial

## Heathkit ANTENNA COUPLER KIT

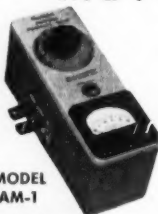
The new Heathkit Antenna Coupler Model AC-1 was specifically designed to operate with the Heathkit Amateur Transmitter and will operate with any transmitter not exceeding 75 watts RF input power. Rugged design has resulted in a sturdy, well shielded unit featuring a copper plated chassis and shield compartment. Coaxial 52 ohm receptacle on the rear of the chassis connects to a three section Pi-type low pass filter with a cut-off frequency of 36 Mc. Tuning network consists of a variable capacitance and tapped inductance in an impedance matching unit. Capacity coupled neon lamp serves as a tuning indicator and will also provide a rough indication of power output.



MODEL AC-1

**\$14.50** Ship. Wt.  
4 lbs.

## Heathkit IMPEDANCE METER KIT



MODEL  
AM-1

**\$14.50** Ship. Wt.  
2 lbs.

The Heathkit Antenna Impedance Meter is basically a resistance type standing wave ratio bridge, with one arm a variable resistance. In this manner it is possible to measure radiation resistance and antenna transmission line impedance, approximate SWR and optimum receiver input. Use it also as a monitor or as a field strength meter where high sensitivity is not required. Frequency range of the AM-1 is 0-150 Mc and range of impedance measurements 0-600 ohms. The circuit uses a 100 microampere Simpson meter as a sensitive null indicator. Shielded aluminum light weight cabinet. Strong self supporting antenna terminals.

**HEATH COMPANY**  
BENTON HARBOR 9, MICHIGAN

ence, WN8RXT, and the only YL in Niles is WN8PUO. EQN is spending the summer at Lakeside. Special mention should be made of UPB, our super SEC, who in addition to his c.d. and RACES activities finds time to accomplish a nice traffic total every month. The Fort Hamilton Bulletin mentions that JAS is a new member; IZT has a new 10-over-20 beam; and DXR is traveling in Europe. We are saddened to learn of the death of FWK. Six members of the Cleveland DX club have their phone DXCCs, with HGW and BF running 1 and 2. Others are AJW, DMD, EWB and JBL. NGW, W8 QSL, Manager, again asks that the DXers get in their envelopes. The Columbus Caroscope informs us that ABO has gone mobile on 2-meter f.m.; ZCK helped VHO install a 44-foot vertical for three-band operation; MSA is getting hot on 2 meters; QDA is back in town with the State Highway Patrol as radio man; KHO has just completed building an s.s.b. transmitter; JKD and JUM are vacationing in Canada; IJ has received his WASS certificate; and GLE is now all-band mobile. It is regrettable to have to report that quite a number of appointments were cancelled this month because of non-reporting. Traffic: (July) W8CJL 450, FYO 339, UPB 264, AMH 250, RO 197, ARO 194, DQG 134, SRF 82, DAE 77, LHV 70, MCQ 63, AL 60, REL 53, CTZ 52, IFX 47, JHJ 37, HUX 36, AJW 31, HNP 29, KHI 28, FJV 22, DG 18, HFE 15, LMB 12, ET 11, CZ 10, AJH 6, HIF 5, JIF 5, APC 4, EQN 4, KZM 4, BH 3, DQV 3, DQW 3, DQY 3, BIM 2, CSN 2, HPP 2, HJZ 2, NQ 2, OQP 2, THJ 2, WYL 2, LVW 1, (June) WSUPB 334, REL 144, DQG 60, (May) W8REL 98.

### HUDSON DIVISION

**EASTERN NEW YORK**—SCM, Stephen J. Newson, W2ILI—SEC: RTE, RMA: TYC, KBT, PAM: GDD, JQI, LJG. Members of the Crystal Club (DMC) were commended on a job well done in a recent emergency drill with the Coast Guard Auxiliary. 28 Mc. was used and the operators were EHJ, IRA, JAP, MRR, and K2CXO. I trust that the gang will excuse any omissions this month since your SCM is writing this while enjoying a well-earned vacation on the Cape. New officers of the RVWARS are NRD, pres.; WGE, vice-pres.; and JKD, secy-treas. Meetings in the future will be held the first Fri. of each month. When called upon for help by the Coast Guard, members of the Pok AREC were quick to the rescue. RTE, ZBS, KCE, K2CXO, and K2GMP established communications on 29.490 Mc. with a stricken schooner in the Hudson River near Pok and handled traffic until all was clear. IJW is QRL because of TVL APJ, after playing with 144 Dxc, is back to mobile on 29 and 3.8 Mc. Irv has held the call since 1921. CFU paid a visit to RTV while on vacation. We wonder if George still has his 95-foot telescoping mast? K2DQN needs ten more states to make WAS before going back to school. OKI has a new vertical feed with 52-ohm coax on 7 Mc. Please do not forget your endorsement date. Check your certificate now. Many more Official Observers are needed. Just drop a line to the SCM for information. Hope that you had a fine vacation and that you will continue to cooperate by sending in your regular monthly reports during the coming season. Traffic: (July) W2EFU 131, K2BBI 110, W2LRW 49, K2BE 45, EQQ 23, W2GDD 14, CFU 13, YXE 13, K2IQN 4, W2MRQ/2 3, (June) K2BBI 53, W2PIIO 7.

**NEW YORK CITY AND LONG ISLAND**—SCM, Carleton L. Coleman, W2YBT—Asst. SCM: Harry Daniels, 2TUK, SEC: ZAI, PAM: JZX, RMA: VNJ, LPJ. BNJ has moved to Los Angeles and as K6GIL will be found on 7- and 14-Mc. c.w. at about 10 p.m. EDT. He has a new MC-183D. ZAI reports the AREC is holding its own during the summer vacations but he would like more reports from the ECs. With no EC at present in Manhattan three new supporting members have been signed up, GQV, DCY, and NLI. Net certificates were issued to NNG, GDJ, and OG. ELT went to WI-Land for a much-needed rest. NTB resigned as OBS because of business and school but manages to get in a few hours each week. WIG is the proud papa of a bouncing boy. E08 has moved to Delaware. KRQ is in the Army Air Force for four years. K2AAB moved to Florida. K2THH and W2EEN are new OBS. CLG has a new 32V-2 and Super Pro, and with a portable rig while on vacation in the northern part of the State made nearly 50 contacts. RWQ visited VE1-Land during vacation. K2CQF reports no time for portable operation during vacation because of QRM from the YLs. GPV has a new Brownie beam on 2 meters. VNJ has been very busy but manages to keep in NLI at times. YL sent to 20 meters during the summer to avoid the QRN on 80 and worked some good DX. PE went to VE1- and WI-Land during vacation. YBT and JGV operated /W1 during their vacations. Nassau County EC, FL reports 30-40 RACES station licenses were issued by the end of July. The 10-meter Nassau Net will hold RACES drills on the first Thurs. of each month. JZX visited NOC, NAI, and K2AMZ. IN is on a cruise to South America. GF is back teaching in WI-Land for the winter. BKN is a new OBS, and has 420-Mc. corner reflector and a twin five on 220 Mc. AMM and BKN maintain regular skeys on 220 Mc. each Sun. 10 to 11 A.M. for those who might be interested. K6GN, Brooklyn

(Continued on page 84)

# New Heathkit VFO KIT



MODEL VF-1

**\$1950**

Ship. Wt. 7 lbs.

Here is the new Heathkit VFO you have been waiting for. The perfect companion to the Heathkit Model AT-1 Transmitter. It has sufficient output to drive any multi-stage transmitter of modern design. A terrific combination of outstanding features at a low kit price. Good mechanical

and electrical design insures operating stability. Coils are wound on heavy duty ceramic forms, using Litz or double cellulose wire coated with polystyrene cement. Variable capacitor is of differential type construction, especially designed for maximum bandspread and features ceramic insulation and double bearings.

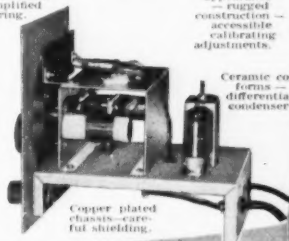
This kit is furnished with a carefully precalibrated dial which provides well over two feet of calibrated dial scale. Smooth acting vernier reduction drive insures easy tuning and zero beating. Power requirements 6.3 volts AC at 45 amperes and 250 volts DC at 15 mills. Just plug it into the power receptacle provided on the rear of the AT-1 Transmitter Kit. The VFO coaxial output cable terminates in plastic plug to fit standard 1/4" crystal holder. Construction is simple and wiring is easy.

- Smooth acting illuminated and precalibrated dial.
- 6AU6 electron coupled Clapp oscillator and OA2 voltage regulator.
- 7 Band coverage, 160 through 10 meters—10 Volt RF output.
- Copper plated chassis—aluminum cabinet—easy to build—direct keying.

Open layout—easy to build—simplified wiring.

Smooth acting illuminated dial drive.

Clean appearance—rugged construction—accessible calibrating adjustments.



Ceramic coil forms—differential condenser.

Copper plated chassis—careful shielding.

## Heathkit AMATEUR TRANSMITTER KIT



MODEL AT-1

**\$2950**

Ship. Wt. 16 lbs.

Here is a major Heathkit addition to the Ham radio field, the AT-1 Transmitter Kit, incorporating many desirable design features at the lowest possible dollar-per-watts price. Panel mounted crystal socket, stand-by switch, key click filter, A. C. line filtering, good shielding, etc. VFO or crystal excitation—up to 35 watts input. Built-in power supply provides 425 volts at 100 MA. Amazingly low kit price includes all circuit components, tubes, cabinet, punched chassis, and detailed construction manual.

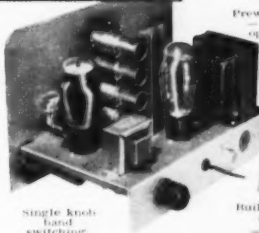
### SPECIFICATIONS:

Range 80, 40, 20, 15, 11, 10 meters.  
6AG7 Oscillator-multiplier.  
6L6 Amplifier-doubler.  
5U4G Rectifier.  
105-125 Volt A.C. 50-60 cycles, 100 watts. Size: 8 1/2 inch high x 13 1/2 inch wide x 7 inch deep.

Crystal or VFO excitation.

Prewound coils—metered operation.

Rugged, clean construction



Single knob band switching.

Built-in power supply.

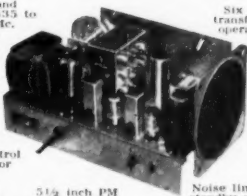
52 ohm coaxial output.

## NEW Heathkit COMMUNICATIONS RECEIVER KIT

Four band operation 535 to 35 Mc.

Stable BFO oscillator circuit.

RF gain control with AVC or M.V.C.



5 1/2 inch PM Speaker, Headphone Jack.

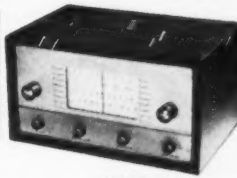
Noise limiter—standby switch.

Electrical bandspread and scale.

### SPECIFICATIONS:

Range ..... 535 Kc to 35 Mc  
12BR6 Mixer-oscillator  
12AR6 I. F. amplifier  
12AV6 Detector—AVC—audio  
12BA6 B. F. O. oscillator  
12AF Beam power output  
5Y3GT Rectifier  
105-125 volts A.C. 50-60 cycles, 45 watts.

A new Heathkit AR-2 communications receiver. The ideal companion piece for the AT-1 Transmitter. Electrical bandspread scale for tuning and logging convenience. High gain miniature tubes and IF transformers for high sensitivity and good signal to noise ratio. Construct your own Communications Receiver at a very substantial saving. Supplied with all tubes, punched and formed sheet metal parts, speaker, circuit components, and detailed step-by-step construction manual.



MODEL AR-2

**\$2550**

Ship. Wt. 12 lbs.

### CABINET:

Phenolic impregnated fabric covered plywood cabinet. Ship. weight 5 lbs. Number 91-10, \$4.50.

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EC reports that he has some interesting drills planned for the fall, and would like to have all the gang who helped so much in the past come forward and join the regulars again to make this next season the best ever. OKU is building a new 300-watt rig. K2EKF has a new ground plane. MUM is a new OBS. The AEEC Novice Net operates Sun, morning on 3755 kc. K2CRH is very active on 20-meter c.w. K2DUC is new president of the Eastern Radio Club. OGG reports that KN2HQ is a new station in the Bronx. IAG reports the Queens 10-meter Net is very active with 20 mobiles, 14 of which are Tu-Boro Club members. IAG is Asst. Radio Officer in Queens. LGK reports that Tu-Boro is enjoying ARRL slides and films and that on Field Day ten mobiles made the trip to Shohola. OME has new "Whipload 6" on his mobile rig and is doing FB on 75, 20, and 10 meters. MUM has 95 confirmed out of 107 worked toward DXCC. OMG has a long wire up at last and is working traffic again. K2DEB wants a sked with a Midwestern station to handle traffic to and from the East Coast. July was a big month at AEE; the school is 200 years old, the engineering school 90 years old, and the radio club a mere 40 years old. AEE has received WAS on 'phone. DDC has been drafted. DAI and DDC both recently were married. KFY reports that 2RN held up well during the summer. KFY is radio officer for the Town of Hempstead. KEB is publicity chief for Malverne c.d. K2EFP is NCS for the eastern section of TXN. The Tu-Boro Radio Club will hold a shindig Sat., Oct. 23rd, at Rascars Hall in East New York with dancing, refreshments, and prizes, at 3 p.m. Contact Joe Hermann, MES, chairman. Traffic: (July) W2JH 136, K2EFP 854, W2KBF 739, KFY 728, JZX 559, LPJ 194, JGV 151, AEE 89, K2ABW 58, W2MCG 47, VNJ 45, K2DEB 42, W2MUM 36, GPQ 24, LGK 17, OME 17, AEF 13, CLG 7, K2DVT 5, W2PF 5, K2CRH 4, W2EC 3, IN 1. (June) W2BO 1075, K2DEB 55, GXC 18, LGK 16, IAG 15, OGX 4. (May-June) K2EOR 769.

**NORTHERN NEW JERSEY** — SCM, Lloyd H. Manamoring, W2VQR — SEC: NKD, PAM: CCS, RM: NKD, EAS, CGG. The section bids farewell to FFX, president of the Ft. Monmouth Radio Club, who has assumed new duties at the General Electric Co., Syracuse, N. Y. K2EUN scored 6880 points in the last CD Party with his powerful little 6L6 rig. DRV is back from vacation. ORV is active in traffic nets. K2CHH is becoming interested in traffic work. JCO is off to Florida on a vacation trip. EAS, RM of NJN reports good attendance during the summer months. JKH is moving to Westwood. RVRC has suspended active club projects until September. NQA finds owning a new house means little time for radio activity. JDI moved into a father-son team with the licensing of 15-year-old son Danny. KN2UC, KN2ETH got General Class tickets. HUZ is building a house on an FB v.h.f. site above New Brunswick. UK is testing out a Long John 144-Mc. array that is worth journeying up the south bank of the Raritan to view on its 80-foot support. The Bloomfield RC is giving Novice and Technician Class exams twice monthly at its club house, 82 Broad Street, Bloomfield. ANG is in charge of the program, assisted by OYD and KLA. NGY has departed from his super high installation and his 32V-2, all a.s.s.h. bank has a new 20A on the air at present but contemplates a kw-linear in the very near future. CVW is reconditioning the station for the new operating season. Lots of the Northern New Jersey gang do not take part in the CD Parties. They should get into the thick of it. K2BCK made WAS during the July CD Party. CFB had his rig on 75 meters for the first time since 1939 and it still worked. K2GBM is busy building a new home but manages to get into NJN regularly. WCL was appointed Assistant Director of the Hudson Division by OBU. K2DSW came up with his best traffic count since he has been in the business, in spite of all the hot weather during July. ZPD sends me the 5th issue of the Bloomfield Civil Defense Radio Section publication, *The Signal*. This is a very fine monthly news letter giving up-to-the-minute information on RACES matters in his city. This takes lots of time and effort on the part of ZPD and he deserves a lot of credit for his fine work. This paper is circulated free to all registered RACES members. K2DHE is communications chairman for c.d. in Asbury Park. GUM is doing a fine job in Long Branch for the local Defense Council. State-purchased radio equipment now is coming into being with the arrival of the first pieces of the equipment at State Civil Defense Headquarters. RACES control stations will be established in each of the 21 counties in New Jersey. Traffic: (July) W2WCL 232, JCO 224, K2DSW 215, W8W 188, W2EAS 95, CQB 77, K2EUN 61, GBM 34, W2OXL 34, ORV 24, DRV 12, FPM 12, NIY 5, CVW 4, K2BCK 2, W2CFB 2, K2CHI 2. (June) W2ORV 12.

## MIDWEST DIVISION

**IOWA** — SCM, William G. Davis, W0P — Nearly 300 attended the Iowa 75-meter Net picnic held in Des Moines Aug. 1st. This event was sponsored by the Des Moines Ham Club. Bob Denniston, of Clipperton fame, president of the Club, welcomed the group. Also heard were YUA, NCS of the Net; PP, SCM of Iowa; and SCA, Asst. SCM. ERP and UDU became grandparents July 6th. ERP is walking the floor as proxy for his son, SCB, who is in Japan with the Army Signal Corps. PAN has a new Zepp antenna and is working on a modulator. TQI has a new VFO. BYE

has joined the Air Force. HUY again is active on TLNCN. QVA lost his antenna pole during a wind storm but has it up again. TLNCN will resume its full Mon. through Fri. skeds Oct. 4th. DVP lives across the street from QVA. YDX has moved to Waseca, Minn. BGN/M worked DLMMN on 29.6 Mc. from West Liberty. SCA tells me BDR made BPL for July but Russ's vacation caused him to miss getting the report to me, so he'll be reported next month. BAL, BFB, PP, and others have been busy getting the WHO-TV 50-kw. stage going. CK now is going strong on 2 meters and giving OLY a bad time. Traffic: (July) W0SCA 1310, CZ 317, KSF 179, ERP 56, LJW 51, BLH 41, QVA 13, PAN 11, NGS 9, SEF 5. (June) W0ERP 72, BLH 35.

**KANSAS** — SCM, Earl N. Johnston, W0ICV — SEC: PAH, RM: KXL, PAM: FNS. Thanks to our Traffic Managers, PAM, RM, NCSs, and you fellows who are right in there moving that traffic, more traffic reports were received the first six months of this year than for the whole year before 1953. EOT held daily skeds with PSH/5/MM while Rex was cruising down the Mississippi to New Orleans. Morning skeds were held on the 3.8-Mc. band but most solid contacts were on the 7.2-Mc. band during the day. PSH/5/MM had a 30-ft. vertical fastened to the mast and a 30-ft. counterpoise trailing in the muddy river. ERA also had contacts with PSH/5/MM and some 'phone patch traffic was handled. YLO, of Scott City, went to Yellowstone Park with a group of Boy Scouts, holding three daily skeds for six days with ZUX. They also had contacts with MI, BYV, EUP, and QNA. Several 'phone patches and formal, and about 20 messages were handled. ZUX also reports some DX contacts on 20 meters such as ZL2BX, ZL3OC, ZP5GF, and OA5N. WGM is active on QKS again. He says the Signal Section is responsible. KSY has been in Wisconsin with KNG. HAW, reporting for N.E. Kansas, says LP and QZ are waiting for their General Class tickets. OF has a new Viking II. EZT and AAW will be on K6CUX in Upland College in California this winter. MOX, of Overland Park, has been working on 2 meters and would like skeds with any of the v.h.f. gang. Traffic: (July) W0HLI 504, NIY 310, EOT 197, MXG 42, ONC 27, SVE 21, W0GM 21, LOW 15, ECD 13, DEL 10, KFS 9, ABJ 7, TNA 6, YFE 6, LIX 5, FJD 4, ICV 4, PSL 4, QMU 1, ZUX 1. (June) W0PSL 78, FEO 26, TOL 19, LOX 2.

**MISSOURI** — SCM, Clarence L. Arundale, W0GBJ — SEC: VRF, PAM: BVL, RM: OUD, QXO, FLN is currently conducting code and theory classes for a number of the engineering students at St. Louis University. While at Camp McCoy, BVL maintained daily schedules with CPL. Upon returning home, BVL found the modulation system in the BC-610 had gone bad. AJC is with the Hazelton Co. in New York. GEF is with RCA located in New Jersey. GNG is with McDonnell Aircraft in St. Louis. RIX has a new De Luxe Bandmaster in operation. W0BUW is on the air with a complete Heathkit station. YHL has assembled a Heathkit VFO. BZK has returned from National Guard camp. QXO had the power transformer rewound and is back with full power. RBJ has been hospitalized and took time with him. KA entered the hospital to undergo surgery. RCV has a Collins 32-V on the air. DFK, and QMF maintain daily schedules on 2 meters. ECF is QRL with work and has a new 40-A Globe Scout. OMG and RMX have converted their Gonset Tribands for 40 meters. CZI was active at Lewallen Scout Camp and took care of the communications with home. VBH again is active on 75-meter 'phone. RTW took his Conditional Class test. Any ham in the St. Louis area who is interested in reserve military work, should contact BVL for further information. OMG has a new Master-Mobile 40-meter HY-Q Mobile Coil which works fine. RMX is building a deluxe mobile receiver. FNN has moved back to Springfield. Traffic: (July) W0CPI 931, GAR 796, QXO 415, GBJ 241, KA 60, LIS 50, BZK 45, QWB 38, HUI 33, EBF 27, RKE 16, BVL 10, CKQ 9, OUD 8, BUL 7, RCV 7, IQC 6, CKE 4, QMF 4, ECF 3, ETW 3, NGX 2. (June) W0LIS 72, ECF 14, QMF 6, ETW 2.

**NEBRASKA** — SCM, Floyd B. Campbell, W0CBH — Asst. SCM-NCS: Tom Boydston, W0YX. SEC: JDI. Those mobiling around the Scottsbluff Area are VQN, JPB, and QKR. QKR was a visitor in North Platte and had a very nice visit with the SCM. EWN is the proud owner of a 10-B cycle. It is with regret that we report the loss of K1 to Nebraska but happy to report his being transferred to Lava Beds National Monument in California. Keep an eye out for Bob as he will be on the air soon. QKR reports a nice vacation in North Platte and Black Hills. RDN is back at the new QTH and will have the Nebraska C.W. Net in full swing. ZJF did a fine job with the Net during the summer months. DQL visited RDN recently. Among other things, QQB now is communications officer for the Omaha Fire Dept. Art spent his vacation in Estes Park but put up new 136-ft. end-fed antenna before leaving. Art has been on 40- and 20-meter 'phone for the summer. CBH and family spent two weeks in Washington State. KXD has D-104 push-to-talk to go with his BAW 5100. A very nice note was received from KN6DRX, at Albion, using Harvey-Weils. He will be on 3730 kc. Traffic: (July) K0ATR 242, W0ZJF 166, HTA 40, RDN 28, VYX 27, F0WBF 20, W0AEM 18, NHT 18, MAO 15, EQG 14, KDW 11, RRH

(Continued on page 56)

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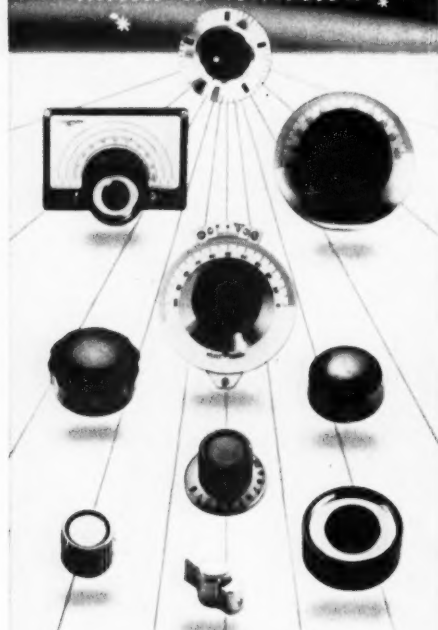
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11. QHG 10, ERM 9, HQN 9, OFL 8, PQP 5, CBH 4, EXH 4, KY 4, ORW 4, CH 3, THX 3, FQB 2, LRK 2, K0WBV 2. (June) W0FQB 1.

## NEW ENGLAND DIVISION

**CONNECTICUT**—SCM, Milton E. Chaffee, W1EFW—SEC, LKE, PAM, RRE, RM, KYQ, MCN and CN, 3640, CPN 3880, CEN 29,580 kc. Traffic seems to move well in Connecticut through CN, MCN, and CPN plus those Connecticut members of TAN and Dragnet. In July, CPN met 26 times clearing 120 messages, CN was top with 193 in 26 meetings, and MCN handled 73 during 22 sessions. All nets welcome new members and can accommodate more traffic, so if you have a yen to handle traffic with some swell operators, note the nets above. New ORS: YNC and 5JXM/1. CUH renewed ORS appointment. A nice letter was received from RAN, who has been making good use of his time at home by adding countries and scoring well in the CD Party. AOS is QRL with domestic obligations. LIG came through again with a page of notes on the shore line gang. NBP is enjoying ham teletype and got good publicity

## C.W.A. SEVENTH ANNUAL CONNECTICUT QSO PARTY October 23-24, 1964

All Connecticut amateurs are cordially invited to take part in the Seventh Annual Connecticut QSO Party to be sponsored by the Connecticut Wireless Assn.

Rules: 1) The Party will begin at 5:00 p.m. EST October 23rd and end at 11:00 p.m. EST October 24th. 2) Any and all amateur bands may be used, and either 'phone, c.w., or both. C.w.-to-'phone and cross-band contacts are permitted, but no extra credit is allowed for such QSOs. 3) The general call will be "CQ CN" on c.w. and "CQ Connecticut" on 'phone. 4) The same station may be counted but once regardless of band. Mobile, portable and home stations covered by the same station license all constitute the same station. 5) Exchange names of town areas. 6) Score 1 point per contact; multiply contact points by number of town areas worked for final score. 7) Reports must show times of QSO, call of stations worked, town area of station worked. All reports must be postmarked no later than November 15th and should be sent to J. A. Moskey, W1JMY, 157 Englewood Ave., West Hartford, Conn. 8) Special recognition to the high scorers and to the highest-scoring Novice. All decisions of the C.W.A. Contest Committee will be final.

Here is an opportunity to see how many Connecticut stations you can work in a 30-hour period. Get on the air October 23rd and 24th and meet the gang around your section!

in the Niantic press. OHI, JMI, and LIG are active on 2 meters. Ex-KH6AQT now is ZLC in Bridgeport. RY has moved to Adrian, Mich. YNC reports to CN. RWD is active in the direction of the c.d. "India" Net. BYB is the only OO with a report. The CN picnic at Hubbard Park, Meriden, was well attended Aug. 8th. MJC has returned to Arkansas where operation is under SSNB. WXR reports a new Elmac AF-67. AREC registration forms were received from Novices AMJ and ZNT, also BNB and WAZ. VLB is operating mobile on 75 meters. UIZ is active on 144 Mc. and schedules VQI and JYU (Maine) with interesting results. Manchester, Waterbury, and Southington have active c.d. nets on the 144-Mc. band. Many appointees, particularly ECs, though active in their communities, are not renewing their appointments. How about all appointees checking on expiration dates. We need your reports, too! Don't forget the always-popular Conn. QSO Party, Oct. 23rd-24th. See box announcement in this section. Traffic: (July) W1SJO 242, WNH 151, CUH 150, UNG 145, AW 123, YBH 101, KYQ 102, LIG 95, TSZ 95, W5JXM/1 73, W1BVB 67, EFW 65, BDI 41, YFM 31, LV 26, RFJ 23, RGB 23, VOV 23, AYC 22, FTM 16, BFS 6, QJM 5, VOS 4, EOB 3, GIX 2, HYF 2. (June) W1VOV 34, VOS 24, FTM 19, KV 8.

**MAINE**—SCM, Bernard Seamon, W1AFT—SEC: BYK, PAM: BTY, RM: OHT. The Pine Tree Net meets Mon. through Fri. at 7 p.m. on 3562 kc.; the Sea Gull Net Mon. through Fri. on 3960 kc. at 5:30 p.m. New Operator's Department: In Lincoln WNHBSU; in Wells Beach, W1BDO. Welcome, gentlemen. We are very pleased to report that BYK is making a fine recovery from recent surgery. VEIACO, of Moncton, paid a most appreciated visit to your SCM, as did TWR, of Gardiner. BX reports that APU is back on 75 meters after an absence of twenty years. His QTH is Dover-Foxcroft in case you have forgotten. All the gang was saddened to hear of the sudden passing of WTD. He was hanging up a new skyhook when it came in contact with a highline. Please keep those antennas in the

(Continued on page 88)

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clear and "switch to safety." Our RM, OHT, says there will be no more ORS appointments unless there is more activity on the Pine Tree Net. Come on you c.w. men, QNI! Also try to send some dope to the SCM. I have only three c.w. men in the entire State of Maine who make regular reports, OHT, LKP, and EFR. Among the many mobiles noted at BPI's Casco Day were one from Connecticut and one from New Hampshire. SIN won the hunt, assisted by a roaring thunderstorm which drove BPI out of hiding. Traffic: WIBPI 78, LKP 78, OHT 55, UZR 31, LYR 26, BTY 25, AFT 11, YYW 11, BX 9, BYK 7, LHA 7, PTL 4, EOP 3, SNE 3, IXC 2.

**EASTERN MASSACHUSETTS**—SCM, Frank L. Baker, jr., WIALP—SQB is the new EC for Reading. Appointments endorsed. LJH as EC for Plymouth. CTW as OES, OLP as EC for Walpole. VJC is mobile on 10 meters. AUU moved to Bryantville. BTC is on 2 meters some. DDO has a new baby boy. IVI is working in Philadelphia. WZQ is on 2 and 6 meters. SKD took a trip to Germany. QMU is moving to Stoughton. Newton c.d. had a test with a plane. LMU went on a plane trip and visited 4LMG, KV4AA, BF, and AI. CMT moved to Pocasset. EK is on 6 meters. PBM has a Gonset Communicator. UKO made BPL this month. WAI, a member of RSGB, has WAC. CTR is in Maine for a change. WU has a new coaxial antenna for 10 meters. BB has new 10/16/20 Telrex beam array. MX, YSW, YFM, and 90HX take part in CD Parties. The South Shore Club held its July summer meeting. VIT rebuilt the rig and has 60 watts. DWO is on some both at home and mobile. ALP met SKMD, who was going through Quincy in a car. The Hingham c.d. group has No. 2 station at the So. Hingham fire station, with TBS-50 and RME 2-11. BW is working on s.s.c. exciter. TQS is going to Washington, D. C., to prep for Annapolis. DJ has TBS50-D on 6 meters and has worked lots of DX. The Braintree Radio Club held a meeting. NE is active on 144 Mc. 2NKS is working in Boston for about a year. BTX, Waltham, has Novice and Technician Class licenses. WNIZUC, new in Scituate, has his General Class license. YTA has an HQ-140X receiver. THO is mobile on 6 meters. WN1BUY, a new ham in Chelmsford, has HT-17 and 838B. HZR got him interested. SQB will have 1 kw. on all bands. VPO, Lincoln, is going to Amherst College and doing some work on JRA's transmitter, which he and YCG built. New calls of members of the South Eastern Mass. ARA are BND, AZU, ATA, and AEN. ZDK, at Otis Air Force Base, Falmouth, is handling traffic for the Cape Cod Area. WGN is Assistant Radio Officer and EC. UIE has a.s.b. 20A rig. MUM has a new jr. operator. HPH wants an antenna farm for his 32V-3 rig. KHV, pres.; YIY, vice-pres.; and UID, secy-treas, have a full sked for the coming season for the South Eastern Mass. ARA. All hams are invited to join up. AMH's jr. operator is stealing the OM's thunder. WN1ZNG, Bob Kiley, 32 Pine Hill Circle, Wakefield, and a group are starting a Novice Net on 3735 kc. on week days at 7 p.m. and invite all Novices to join them. WN's AJG, AJM, AJX, BER, BGL, and BJW are present members. Drop WN1ZNG a line if interested. SBT has a new baby boy. AGB is mobile on 2 meters. 2UEI is getting married. Winthrop's last c.d. drill had SBT, DJ, OIR, NMX, WJZ, AGB, CMW, HFJ, and BB active. SBT is moving to Natick. They now have 3 Gonsets for c.d. work. CLF is active on 40 and 10 meters and has a Lysco ground-plane antenna. IA will be on the air each Mon. night on 10 meters for Quincy-Milton Net, also for Sector 5 Net, and to pass along any bulletins or news to members of the South Shore Radio Club. It is expected to have another TBS-50D and an NC-183 soon, also a Gonset Communicator on 2 meters. ALP has a Meissner Signal Shifter. Traffic: WIUKO 504, VVA 356, WAI 208, AVY 115, UE 46, TY 37, UTH 34, BY 22, IBE 22, CTR 16, WU 10, HWE 6, QON 6, BB 5, IA 4, CLF 3, LM 3, AHP 2, EMG 2, EPE 2, MX 2.

**WESTERN MASSACHUSETTS**—SCM, Roger E. Corey, WIJYH—SEC: KUE. RM: BVR. PAM: RDR. WMN meets at 7 p.m. EDST. Mon. through Fri. on 3560 kc. UVI, BVR, LRA, ALC, VBG, and WN1s ZBA, AOC, and UFP pitched in with the Westfield c.d. group to help out in a recent storm emergency. EFC took his new mobile to Vermont on vacation. COI found that his lawn and garden grew faster during the summer than his DX total but has a Q5-er and a new rotary under way to help remedy the situation. BVR is sporting a new Heathkit VFO. RZG filed in nicely on WMN while enjoying his summer vacation from Yale. WEF has a new 813 rig ready for the next contest. TVJ rolled up his FB traffic total this month in just 11 days. WCG has a new VFO 813 rig with 250 watts on all bands. A new c.w. traffic net has been formed which will operate Mon. through Fri. on 3735 kc. at 7 p.m. EDST. Although principally for training Novices, the net is open to all. For details contact Bob Kiley, ZNG, 32 Pine Hill Circle, Wakefield, Mass. UKR is a new OPS. UPE, UPF, UPG, and UPH operated mobile from New York while on vacation. SPF is on 10-meter mobile with an RME-53 converter. MYF also operates from the car with a new Gonset Super Six. WCG, WEF, QWJ, ZIO, BKG, JYH, MNG, WDW, and CJK took part in the CD Parties, and BDV/I joined in from his summer home to give them a Maine contact. YXY is up to 16 countries with 75 watts and a nice lot of wine. AJX got his General Class license. Traffic: WITVJ 322, BVR 56.

(Continued on page 90)

# MALLORY HAM BULLETIN

## Better Protection for Your Transmitter and Yourself... When You Use Mallory Wire-Wound Resistors



Wire-wound power resistors of the vitreous or baked enamel type have always been an important component in the construction and operation of amateur and commercial transmitters, yet, too often these resistors have been selected and purchased entirely on a "sight-unseen" basis with no thought given to the technical merit of the unit purchased.

This is unfortunate, because the undetected failure of just one of these resistors in a transmitter can be of serious consequence not only to the personal safety of the unsuspecting operator, but also in the costly replacement of expensive transmitting amplifier tubes.

Generally, the failure of wire-wound enamelled power resistors can be attributed to one or two important chemical-mechanical factors.

For example, resistors carelessly manufactured with an inferior grade of enamel, composed of chemicals of highly alkaline characteristics, soon fail because of corrosive action on the wire windings of the resistor coil. Leakage of moisture through the carelessly applied enamel also accelerates the corrosive action and results in a resistor of "high resistance" characteristics. In these cases, an original 10,000 ohm resistor may have a measured resistance of 100,000 ohms or more.

In addition, some resistors fail because of a mechanical tension created as a result of the unlike coefficient of expansion between the enamel coating and metal end-straps to which the resistor coil is terminated. Since the enamel as well as the metal end-straps firmly grasp the tiny resistance wire, any difference in temperature expansion results in increased tension on the resistance element, with eventual breakage of the wire. The end result is an "open" resistor.

All these factors have been carefully analyzed in the design and manufacture of Mallory wire-wound power resistors, and corrective measures taken to minimize the chance of failure. All Mallory resistors use a special non-alkaline, non-hygroscopic enamel which seals the resistor coil completely under a tough glass-like, moisture-impervious barrier. This enamel is carefully applied and cured to eliminate pin-holes and internal air bubbles which can be so troublesome.

In addition, the metal terminal straps of Mallory resistors are made of a special alloy whose coefficient of expansion is practically identical to that of the enamel covering. This means that the opposing forces normally resulting from unlike temperature coefficients are for all practical purposes equalized, thus reducing the possibility of lead breakage at the junction of terminal strap and resistor coil.

Your Mallory Distributor has these resistors for your inspection. Examine the smooth, even enamel on these resistors. You will see a difference right away. Check their price, too. Surprisingly enough, you will find you can buy Mallory premium quality at standard prices.

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**D103T • Deluxe 10m 3-EI. T match, \$25.95.** 1—8' Boom, 1" Alum. Tubing; 3—6' Center Elements, 1" Alum. Tubing; 6—6' End Inserts, 3/4" Alum. Tubing; 1—T Match (4'). Polystyrene Tubing; 1—Beam Mount.

**S104T • Std. 10m 4-EI. T match, \$24.95.** 1—12' Boom, 1" Alum. Tubing; 4—6' Center Elements, 3/4" Alum. Tubing; 8—6' End Inserts, 3/4" Alum. Tubing; 1—T Match (4'). Polystyrene Tubing; 1—Beam Mount.

**D104T • Deluxe 10m 4-EI. T match, \$30.95.** 1—12' Boom, 1" Alum. Tubing; 4—6' Center Elements, 1" Alum. Tubing; 8—6' End Inserts, 3/4" Alum. Tubing; 1—T Match (4'). Polystyrene Tubing; 1—Beam Mount.

### 15 M. BEAMS

**S152T • Std. 15m 2-EI. T match, \$22.95.** 1—12' Boom, 1" Alum. Tubing; 2—12' Center Elements, 3/4" Alum. Tubing; 2—5' End Inserts, 3/4" Alum. Tubing; 2—7' End Inserts, 3/4" Alum. Tubing; 1—T Match (6'). Polystyrene Tubing; 1—Beam Mount.

**D152T • Deluxe 15m 3-EI. T match, \$39.95.** 1—12' Boom, 1" Alum. Tubing; 3—12' Center Elements, 1" Alum. Tubing; 2—5' End Inserts, 3/4" Alum. Tubing; 2—6' End Inserts, 3/4" Alum. Tubing; 2—7' End Inserts, 3/4" Alum. Tubing; 1—T Match (6'). Polystyrene Tubing; 1—Beam Mount.

### 20 M. BEAMS

**S202N • Std. 20m 2-EI. (No T), \$21.95.** 1—12' Boom, 1" Alum. Tubing; 2—12' Center Elements, 1" Alum. Tubing; 4—12' End Inserts, 3/4" Alum. Tubing; 1—Beam Mount.

**S202T • Std. 20m 2-EI. T match, \$24.95.** 1—12' Boom, 1" Alum. Tubing; 2—12' Center Elements, 1" Alum. Tubing; 4—12' End Inserts, 3/4" Alum. Tubing; 1—T Match (8'). Polystyrene Tubing; 1—Beam Mount.

**D202N • Del.uxe 20m 2-EI. (No T), \$31.95.** 2—12' Booms, 1" Alum. Tubing; 2—12' Center Elements, 1" Alum. Tubing; 4—12' End Inserts, 3/4" Alum. Tubing; 1—Beam Crosspiece, 1" Alum. Tubing; 1—Beam Mount.

**D202T • Del.uxe 20m 2-EI. T match, \$34.95.** 2—12' Booms, 1" Alum. Tubing; 2—12' Center Elements, 1" Alum. Tubing; 4—12' End Inserts, 3/4" Alum. Tubing; 1—T Match (8'). Polystyrene Tubing; 1—Beam Crosspiece, 1" Alum. Tubing; 1—Beam Mount.

**S205N • Std. 20m 3-EI. (No T), \$34.95.** 1—12' Boom, 1" Alum. Tubing; 3—12' Center Elements, 1" Alum. Tubing; 6—12' End Inserts, 3/4" Alum. Tubing; 1—Beam Mount.

**S205T • Std. 20m 3-EI. T match, \$37.95.** 1—12' Boom, 1" Alum. Tubing; 3—12' Center Elements, 1" Alum. Tubing; 6—12' End Inserts, 3/4" Alum. Tubing; 1—T Match (8'). Polystyrene Tubing; 1—Beam Mount.

**D205N • Del.uxe 20m 3-EI. (No T), \$46.95.** 2—12' Booms, 1" Alum. Tubing; 3—12' Center Elements, 1" Alum. Tubing; 6—12' End Inserts, 3/4" Alum. Tubing; 1—Beam Crosspiece, 1" Alum. Tubing; 1—Beam Mount.

**D205T • Del.uxe 20m 3-EI. T match, \$49.95.** 2—12' Booms, 1" Alum. Tubing; 3—12' Center Elements, 1" Alum. Tubing; 6—12' End Inserts, 3/4" Alum. Tubing; 1—T Match (8'). Polystyrene Tubing; 1—Beam Crosspiece, 1" Alum. Tubing; 1—Beam Mount.

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WCG 38, TAY 36, SPE 28, JYH 10, RZG 10, WEF 10, RR 9, UVS 8, DUV 7, EFC 3, OBQ 1.

**NEW HAMPSHIRE**—SCM, Carroll A. Currier, WIGMH—SEC: BXU, RM: CRW, Asst. RM: TBS, PAM, AXL, VGX has a new Edico electronic key and says it is FB, RPL, sponsor of the Barnyard Net in Maine, on 3960 kc. Mon. through Sat. from 0730 to 0900, invites any of the New Hampshire gang to call in. TBS is sure traffic-minded; he is Asst. RM, is in TCC as EAN representative to CAN, and has a certificate for UTL. A good time was had by those who attended the Dragnet picnic at PU's VSO, of Colebrook, is putting a line signal on the air. CDX is located in a new shack. COC is doing a fine job as NCS for Merrimack County Emergency Net. The Manchester Radio Club is working hard on plans for the convention to be held Oct. 10th. RZF and IBE called on GMI, FTI and BET entertained K2IWO and her OM, who have just returned from an assignment in England. This will be my last report as your SCM. It was a great disappointment to me to have to withdraw my name from the list of candidates but because of the break in my health I felt it was the only thing to do. I have enjoyed the work and hope that you as a group have not been disappointed in my efforts. If not, I am well paid for what I have done and will say, "All the best to you and yours, 73 and 88." Traffic: WIGMH 181, WUT 66, COC 35, QGU 25, POK 11, CDX 6, FZ 6, WBM 4, VGX 2.

**RHODE ISLAND**—SCM, Merrill D. Randall, WJBB—SEC: ALJ, RM: BTY, RIN meets Mon., Wed., and Fri. at 1900 E18ST on 3540 kc. Even your reporter succumbed to the vacation fever last month. Thanks to TRX, who very ably took over, the "word" was passed. K0BTE-1 has moved into our hailiwick and is anxious for local QSOs. Look for him on 40, 80, and 20 meters. AIT was off the air for six weeks from home QTH. OIK says the reason we didn't hear from him for so long was a rig failure. BTY's jr. operator got the call WN1BQH. The RINN picnic was a huge success! This section has just lost ULG, who has been transferred to Florida. We will all miss "Commander Bob" who has done an excellent job in public relations for hams of not only Rhode Island but all over the world. Traffic seems to have come to a screeching halt with only one for July! It should again be stressed that one of the requirements for OPS and ORS appointment is membership in ARRL. We have been receiving requests for endorsement from a few who have not renewed their membership in ARRL. Traffic: (July) W1VXC 48, (June) WBTV 87, VXC 45, AIT 40, OIK 30, YKQ 17, WN1BQH 7.

**VERMONT**—SCM, Robert L. Scott, WIRNA—PAM, RPR, RM: OAK, Vermont nets meet on 3520 and 3860. A total of 105 (registered) persons enjoyed the Vermont phone-c-w, family picnic at Branbury State Park on Lake Dunmore Sun, July 25th, in spite of the doubtful weather. The BARC had its station, KOQ, set up operating with emergency power on 75 with an extra receiver monitoring 10 meters, 10-meter walkie-talkies, home-built, were demonstrated. One of these was used as a public-address system with the 10-meter receiver as a loudspeaker for remarks by the SCM, RM, Asst. PAM, and Manager of the Green Mountain Net. Out-of-state visitors included UVF, UFW, HYF (ex-SCM) from Connecticut, PTR and UXS from New Hampshire; 20HN, WMN, and K2CKN from New York; IHPG from North Carolina. Thirteen known mobiles were there operating 75, 10, and 2 meters. UXS won the mobile treasure hunt. Various net activities and the ANC's set-up for the coming year as well as the possibility of Burlington and Middlebury putting on a hamfest next year were discussed. Traffic: W1OAK 128, RNA 105, AVP 60, VZE 28, BJP 25, TLI 15, TAN 11, KJG 10, IT 3, RWP 3, UGW 3.

### NORTHWESTERN DIVISION

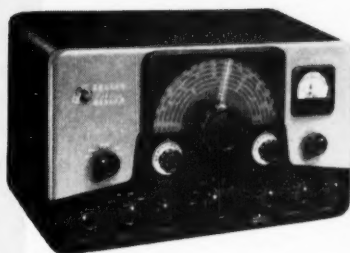
**ALASKA**—SCM, Dave A. Fulton, K1TAGU—MZ made a quick trip to the States and return. He flew out and drove back over the Highway. He has been very busy getting settled in the new QTH and both he and the XYL, W7RTN, should be heard on the air more often now. SX is back on the air after a long period of silence. RE has been back on both mobile and from the home QTH. We understand RE is going to make some changes around the shack and will have more power and a new antenna. ATL has been busy traveling. He was out to Kodiak, Adak, and has just returned from Nome. ATI left for the States and was mopping down the Alaska Highway. We worked him from Anchorage with our mobile unit when he was mobile VE8 at Mile 111, on the Alaska Highway, the first mobile we have ever heard after they left Anchorage. With all the new mobiles on the air now, how about some new AREC members?

**IDAHO**—SCM, Alan K. Ross, W7IWU—Kellough: A nice letter from RQG reports on the gang around there. RSQ moved back into Kellough from Coeur d'Alene. PTI directed a Boy Scout camp this summer, and expects to leave for college in the fall. The new club secretary is WN7WHZ, HXN and his XYL, HIQ, are back on with a GO-9 transmitter. The Big Springs Hamfest was a great success, with 143 registered and 73 mobiles, and received a nice write-up in the *Ham Bone* by MM. BAR and his

(Continued on page 92)



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A rugged, compact transmitter, the Viking Ranger may also be used as a flexible exciter without modification. Self-contained, 75 watts CW or 65 watts phone input. Crystal control or extremely stable built-in VFO—100% AM modulation—high gain audio. Pi-network antenna load matching from 50 to 500 ohms—complete TVI shielding and filtering. Covers all amateur bands from 10 to 160 meters—completely bandswitching. Used as an exciter, the Ranger will drive any of the popular kilowatt level tubes, providing a quality speech driver system for high power modulators as well. A power receptacle at rear provides filament, low voltage, and modulator plate power for operation of an auxiliary VHF rig on other equipment.

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**Cat. No. 240-161**—Viking Ranger Kit, less tubes, crystals, key and mike..... **\$179.50 Amateur Net**

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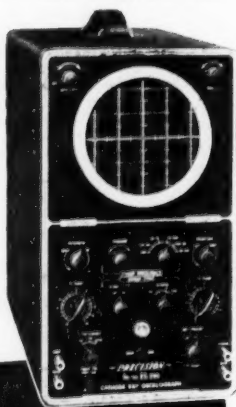
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XYL are president and secretary for the next year. Boies AXV and BMF are going strong on single sideband. TZA is collecting parts for same. The GEM Net again is active (c.w.) on 3638 kc. with SUZ, Boise, as NC on Mon.-Wed.-Fri. 9 P.M. MST. All interested in c.w. are welcome. May I urge all Idaho appointees to report monthly. Traffic: WTEYR 8.

**MONTANA**—SCM, Edward G. Brown, W7KGIJ—The Great Falls Radio Club's new officers are UWN, pres.; JGG, vice-pres.; and LWR, secy-treas. The Great Falls gang has been very active in emergency work and we hope the interest will continue. Montana hams were invited to Lewistown for a pot-luck picnic and we will have more news on this later. It seems to us that Lewistown is a good centrally-located spot for an annual hamfest and would allow more Montana hams to attend than any other location in the State. CT reported that he had a very enjoyable time at the Glacier Hamfest with a swell gang and good weather but that the attendance was a little under what he had expected. We have had no report on the Big Springs Hamfest as yet. PCZ has been doing a little DXing on 20 meters with VU1, AC4, V89, and ZC5 to his credit. JRG is working a few stations on 6 meters. Now that the vacation season is over we should start getting some interesting activity reports. Traffic: (July) W7NZJ 5, PCZ 4, (May-June) W7PCZ 48.

**OREGON**—SCM, John M. Carroll, W7BUS—OSN reports very little activity because of vacations. OMO is doing a good job in getting out the OSN bulletin, which will carry more information on procedure and operating practices. TH reports returns on cards sent out on OSN still coming in. AJN, the RM, is active in all nets and asks for suggestions to improve membership this fall. LMZ is the new EC for Myrtle Point. QEP has a new jr. operator. David Rohand, QWE is looking for a new QTH. REX has gone mobile. The 29.2 Mc. Portland Net will take part in the Hobby Show at Gresham. HUT is anticipating activity on 10 meters and is putting up a new beam. 2FKD is a mobile visitor in this section. OAP writes regarding club information. AFX is going strong with his new mobile. The Pendleton Radio Club has a larger schedule of fall activities and is building a float for the various parades. HDN represented the SCM (still on crutches) at the Baker Club picnic. MQ still is installing v.h.f. equipment commercially. The Cascade Net reports 387 check-ins with LRT topping the Net Controls with nine times. Traffic: W7PRA 79, AJN 61, HDN 50, THX 48, QEI 42, OMO 23, ESI 7, EDU 6, KTL 5.

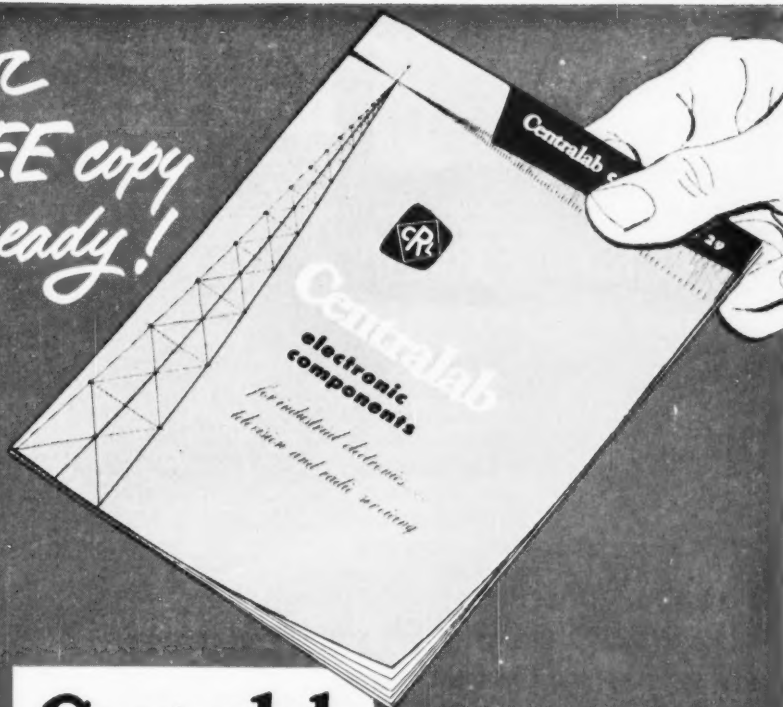
**WASHINGTON**—SCM, Victor S. Gish, W7FIX—BA, PGY, and FRU made BPL. New officers of the North Seattle Radio Club are QHI, pres.; NUN, vice-pres.; JPH, secy.; CO, treas.; UGV, sgt-at-arms. PGY and LWB, directors. JFB resigned as OBS because of other activities. RTQ has a new B&W 5100. PGY now is a member of AF MARS. FVW reports an enjoyable trip to Anchorage, Alaska. UGY sends in a fine QO report and an impressive list of DX worked on 40 meters. LAF is chief operator of the Christian Radio Fellowship Net that meets Mon. on 3900 kc. at 1900 PST. Other members are AHV, EVL, HVB, IOY, PYP, TVA, UFD, RZL, and VI. Because of long and persistent industry rather than immediate results, CBE is becoming known as an authority on VFO construction. BA states glass rods are OK for fishpoles but wonders as to whip tips—he has busted two to date. JPH has moved to a new QTH near NUN and PGY. OZG's new QTH is a hand-picked radio station above Edmonds, Wash. Vacationing and absent from the Upper 44 Ave. Fish & Chowder Club (Seattle) are KZP, OZG, CBE, and JNC. ALU is back on 2 meters after a long absence. JHX reports the northwest 2-meter gang is going to horizontal. BA and PGY have their own private 2-meter pipeline. CWN made WAC at last. FWD and FWR are QRL canning, house-cleaning, and painting the house and towers. VE7ASR and W7HDT visited the SCM. HDT is EC for Asotin County and Clarkston. TGO is building new mobile. PYV is building new 160/80-meter rig for WSN use. ZU is on 'phone and reporting on WARTS with modulator built by PRZ, the jr. operator. The WARTS Net elected GJB as new manager with ORK and QYN as assistants. BMK (Jokoi) VPS4Z on 7 Mc. with 50 watts. BG is down with lumbago from remodeling the house. ETO reports not much activity because of TV (not TVI). HMQ reports from Puyallup Valley: OEB is heard on 75 meters (phone?); LEC is on 80 and 40 meters with new 811 job; MTX and HMQ have new Rangers; KHL was home for ten days from Alaskan waters; MCG and JJK are working RTTY on 80 meters; NZM is conducting the Pierce County AREC Net on 29.51 Mc.; W7WHV is the first LY member of VARC. Traffic: (July) W7BIA 1738, PGY 923, FRU 835, HKA 221, TGO 70, APS 68, RXH 66, USO 51, GAT 41, FWD 39, PYY 39, ZU 35, FIX 32, JPH 22, AMC 17, AIB 14, EVW 6, BMK 4, NWP 3, DDY 2, ALU 1, AVM 1, (June) W7PGY 1147, RXH 96, KT 84, AMC 24, EVW 8, NWP 4.

#### PACIFIC DIVISION

**HAWAII**—SCM, James E. Keefer, KH6KS—I have been advised that the October issue of QST will carry a call for nominees for the position of SCM of Hawaii with nomination.

(Continued on page 94)

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M-7A	14.45	4250 C.T. for 6U7's	300-3000	3000-5000-8000	200	60
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nations to close Nov. 15, 1954. Once again I ask that all of you consider the matter carefully and put on a campaign for your nominee! In the meantime KH6KS will continue to accept traffic reports. The biggest group to report in the past year showed up for July. KA2NY, KA2GE, KH6USA, KA2AK, KA2FEC, KA7SL, KA9ME, KA4DR, KA7RC, KA2FC and KH6AJF all reported heavy traffic with the States. KH6AA's total was low because they are moving to a new QTH, an obsolete airport control tower with glass enclosed cab no less! KH6USA also is being rebuilt, complete with new antenna farm. Traffic: KH6USA 2620, KH6AJF 1091, KH6FAF 358, KH6FAA 263.

NEVADA — SCM, Ray T. Warner, W7JU — K7FDB, of Stead AFB, continues to be the outstanding traffic station of Nevada, turning in the tremendous traffic count of 3753 messages handled. Good work, fellows. 5DYV 7 is active with a Heathkit transmitter. TXI now is mobile. VDC reports in regularly and spends most of his time pushing traffic at K7FDB. VII ran up close to 50,000 points in the last C.D. Party. He has now worked 20 countries with his new Viking. RBV, of Las Vegas, reports in with a traffic count of 65. FEW is heard regularly on 20- and 40-meter c.w. UPS has a Viking and an 876 and is making application for AREC membership. SXD, of Boulder City, is heard more regularly now that his new Viking has been completed. TKV, who is cramped for antenna space, is doing well with a short off-center fed antenna. RKE and TCK, of Boulder City, are both active on 10 meters. Traffic: K7FDB 3753, W7VDC 91, RBV 65, JU 11, VII 8.

SANTA CLARA VALLEY — L. Conzin, W6LZI. — The month of July will long be remembered by over five hundred hams who attended the Pacific Division Convention in San Jose. It was very well planned, with wonderful prizes and a super feed thrown in to make it one of the finest in a long, long time. The presence of President Dodland and George Hart from Headquarters topped it off. LNX is back from his vacation which was interesting as he, RLB, and WSL went to Pike's Peak in Colorado to try some DXing on 144 Mc., but he says the attempt was only partially successful. GXT moved to the Emerald Lake section of Redwood City and hopes to be on 144 Mc. soon with his sixteen-element beam. ZNS and his XYL JKC, added a baby girl to their family recently. K6DOS is smoothing out the bugs in his Lyseo rig. TKM became the proud owner of a harmonium recently. WJL sent a line report of his activities as OO and forwarded some letters of appreciative hams who thanked him for his effort in warning them of out-of-band or bad-signal operation. OHF, who is vacationing with the Army, dropped me another line from Camp Gordon, Ga., and wondered if any of his friends in the area would make the effort to drop him a line and give him a little news of the doings in the area. His address is Gene, 601F, Camp Gordon Radio Club, Camp Gordon, Ga. The Mountain View Amateur Radio Club had Dr. A. M. Peterson, of Stanford University, who spoke on "Sporadic E Layer Phenomena." The SCCARA skipped its meeting in lieu of its hamfest. The San Mateo County Radio Club also had a speaker at its meeting. Traffic: W6LTV 58, MMG 4.

EAST BAY — SCM, Guy Black, W6RLB, Asst. SCM, Oliver Nelson, 6MXQ, Harry Cameron, 6XTC, WGM, RMS, 1PW, JOH, PAM, LL, EC's, CAN, CX, FLT, QDE, TCU, ZZF. K6GEHQ is an ex-member of AREC in Oakland. LTI is new Class IV OO. General and amateur class license exams are now given by the FCC on Fridays. Will those willing to monitor the mail examinations for Novice and Technician licenses, drop me a note? JHV and DYT enjoy their Viking Rangers. The North Bay Amateur Radio Assn. meets the 1st Fri. of each month in the Vallejo Red Cross. The s.s.s.c. gang now includes LWD, BM, BMY, FZC, TT, ASJ, and UHM. VFW has had lots of experience wiring up Central Electronics Kits. The SARO has purchased two 10B kits to be loaned free to members to get them acquainted with single sideband, and will construct two 2-meter rigs for the same purpose. UCP gave a talk on frequency measurement to the Oakland Radio Club in August. JZ is working on a new network rig especially for code practice transmissions. YDI has been traveling to Missouri. HBE is on 75-meter 'phone with low power. JOH's new QTH is 567 Capell St., Oakland. K6WAY has 65- and 75-foot steel towers to boost the antennas out of the noise level. K6BDF has been up to Anchorage. JZ reports a MARS net is getting started on 148.01 Mc. ITH reports some traffic handling but still is mostly experimenting with TTY. K6GWE is the call of the V.H.F. Expeditionary Society Station on Vollmer Peak. The v.h.f. gang is all set to give IHDQ the dope on West Coast v.h.f. when he appears at the v.h.f. hamfest scheduled for Oct. 3rd. VSV, MXQ, and RLB have new Workshop 6-meter three-element beams. VSV, MXQ, LOZ, GQK, and DSZ made an arduous trip to White Mountain, trying to establish new 2-meter DX records. RLB was listening for them on Pike's Peak. Colo. DIX was the 14th operator to receive the WACC certificate of the Oakland Radio Club. K6AVD has 200 watts and a long wire on 20 meters. K6DCA operates n.f.m. on 75 meters. New calls on TTY are NPB, US, and K6BRO. LGW is waiting for a chance to get up his 10-meter beam. NTU spoke at the Mt. Diablo Radio Club in August. Friends of SPF, a polo patient at the Contra Costa County Hospital, have provided him with a transmitter and receiver, and

(Continued on page 96)

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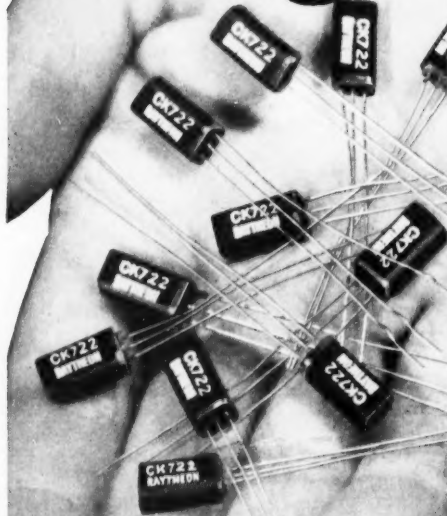
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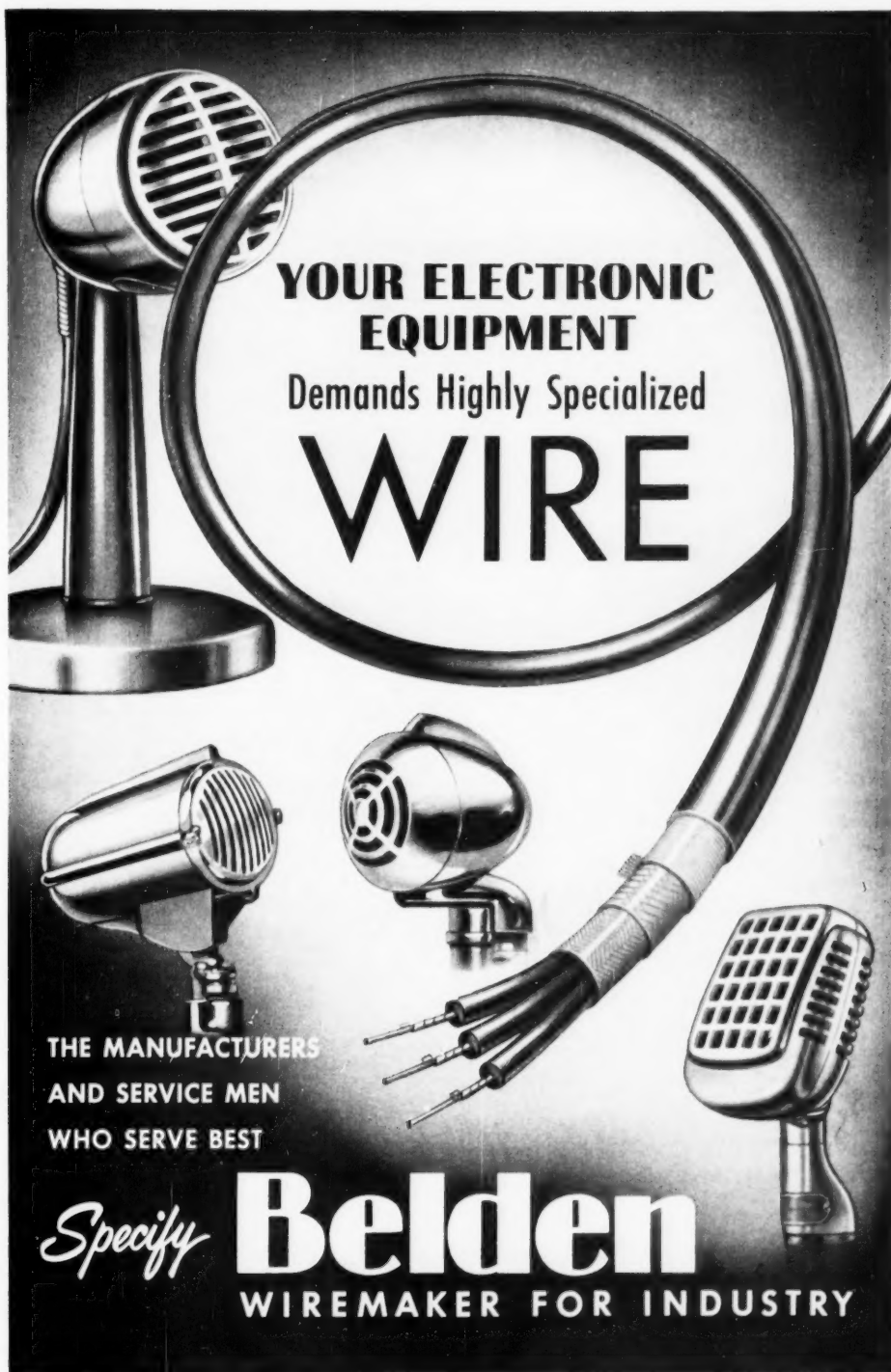
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obtained permission to install the antenna on the roof of the isolation ward. He will be able to go on the air when a small remote control unit, operated from inside the iron lung, has been perfected. Traffic: (July) K6FDG 1645, W4Y 258, BDF 144, W6QPY 91, JZ 43, HBF 18, JOH 17, EJA 9, YDI 3. (June) W6JOH 105, ITH 49.

**SAN FRANCISCO**—SCM, Walter A. Buckley, W6GGC—SEC: NL, EC, BYS. Two new calls in Humboldt County are KN6G80 and KN6G8A. A fine turnout for Field Day is reported, also a fine picnic day at Patriots Point State Park. Congratulations to Ellen and Ed Kirkwood on the birth of a grandson. The Marin Radio Club took a trip over to Larkspur to attend the July meeting but it had been cancelled. The Hifrequency Amateur Mobile Society July meeting was very informal; only 16 showed up because of vacation schedules. The San Francisco Radio Club's guest speaker for the month was FNC, who told of his mobile trip with ham gear and direction-finder detector in trying to find the lost raft *Lehi*. Director Ray Cornell also attended the meeting. Dr. Ray, from the Philippines, was in the U. S. to attend a medical meeting and met many of his fellow hams at the club meeting. The 29ers started a bingo game via the 10-meter band with fine results. The relay station was mobile high on Twin Peaks. The East Bay Skyriders, 29ers, and Mobileers are planning a group breakfast for the near future. The Young Ladies Radio Club of S. F. had a little gathering at PCN's QTH for 2EEO, Madeline Greenberg, while she was in San Francisco with the OM. Two more code pupils of QMO are ready for the test. The San Francisco Naval Shipyard Club is planning a picnic to be held Sat., Sept. 25th, at Flood Park, San Mateo. 2CYK, Art Greenberg, former president of the New York Radio Club attended the San Francisco Radio Club Board Meeting and was interested in seeing how such a large club handled affairs. He also was interested in the 10-meter transmitter monthly hunts and how points were counted. ATO received a certificate at San Jose as being "Mr. T. V. Pacific." He and his crew put in many hours of hard work and deserve lots of credit. UEV's new QTH is Corde Madera. GHI is the proud owner of an Elmac rig for mobile. VC was lucky a second time in contacting LU3HL, formerly LU2CA, his old of 25 years ago. GGA is busy rebuilding his rig. GCV checks into MARS every Wed. night. CBE won the 10-meter hunt at the San Jose Convention on the first transmitter hunt. San Francisco Civil Defense meets on 145.59 Mc. every Mon. at 8 P.M. NL pulled a surprise on the boys recently. He turned net control over to a mobile rig and says each fellow should be prepared to handle the job in case of disaster where the regular control station may be damaged. ARCC, on 3.9 Mc. at 10:30 each Sun., recently discussed detectors and their value. KZF feels the matter should receive consideration. With 75 meters Sun., 2 meters Mon., and 10 meters with 18 mobiles ready for action at all times, e.d. really is getting on the ball locally. Condolences and sympathy from all amateurs in the section to CEW, who lost both his son and daughter in a private plane crash. Congratulations to HLB on the swell job he's doing on the *CCRC Calendar* each month. Los Angeles is interested in having a contest game of chess between San Francisco and Los Angeles. I wish to take this opportunity to thank the ARRL appointees in this section for such prompt reports each month and certainly appreciate the wonderful cooperation I have received. Congratulations to SWP, QMO, and PHH on making BPL. Traffic: W6SWP 1746, QMO 603, PHH 537, GCV 28, VC 14, MWF 10, GGC 6.

**SACRAMENTO VALLEY**—SCM, Harold L. Lucero, W6JDN—PRM, GHP, GPN, CCX, OXG, HTS, K6FAV, LZM, and DMA are active on e.d. nets. VUU, ETD, JDN, K6FAV, AK, VBI, and NCG are active in MARS. LER and UAF were visitors in Klamath Falls, Ore., during the convention. SVY is doing new work in e.d. K6DBA, HX, K6ADP, W6CCR, and RKI are on 75-meter mobile. TYC and MIW moved to new QTH. K6DBA has trouble with mobile receiver. ENS has new car and mobile. UMK has moved to New Mexico. YFP is back on the day shift. REP is in Oregon temporarily. HIR has a new Elmac transmitter. ROO has new 10-meter vertical. QGS is now with Ma Bell. NJF and VYE are vacationing. ASI is toying with 4-125As in new amplifier. AK is recovering nicely from an operation. LSK is fighting mobile trouble. K6ER operates portable each week end. MYT is back on after "slack trouble." OOC is on vacation and is mobiling. HSV still is recovering from Field Day. ICB has a new antenna system. K6ALA is a newcomer to Sacramento. QDT is rebuilding 1 kw. NEH is experimenting with antennas. GDO has mobile in new station wagon. UYK has new mobile. GKW is on 75 meters. ZI and CIS are experimenting with new vertical antennas. PVI is building new 2-meter gear. The latest addition to Chico is KN6GSK, the XYL of W6TKE. HNL has a new guide dog. K6BDH has been drafted. GVA is with the Forest Service. Let's support the NTS and also work with our RMs and improve our operating practices. Fellows, we are calling a section meeting at Chico in September, the date to be announced via radio. It is to be an open forum, so get together with your constructive groups. The Pacific Division Director will be there. A new club has been formed in Oroville. Traffic: W6QPY 238, MWR 12, SDP 12, JDN 5.

**SAN JOAQUIN VALLEY**—SCM, Edward L. Bewley, (Continued on page 98)



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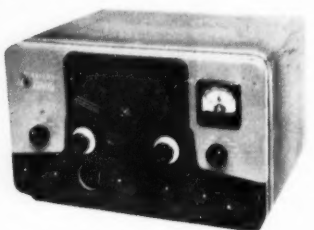
# QSO

by "Rocky"

Dear OM:

October is the month of ghosts, goblins and Halloween parties, and the kiddies down the street will be around for "trick or treat" again.

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W6GIW -- SEC: EBL, RM, K6BGM, PAMs, ZRI, WJF. You will notice two changes in leadership appointments this month. EBL is our new SEC, replacing KRO who moved from the section, and K6BGM is taking over the reins as RM, replacing OPU, who resigned because his work does not allow him sufficient time to handle the job the way he wants to. I hope you will all support the new leaders as you have the old ones. The SJVN Traffic Net is inoperative at the present time, because of lack of members, but Ann, K6BGM, assures me something will be done to keep a c.w. net active in the section. BUA has a 4-65A mobile. BCY is busy with c.d. work and is organizing communications for a parade in Merced. K6BMM has Collins surplus 150 RA32 and is building mobile gear for c.d. work. WJF and FEA attended the YL-OM picnic of the YLRL in South Gate. K6FAE is handling the biggest load of traffic in the section, according to reports, with a daily sled with Japan. TTX is using a Viking II with a BC-696 VFO, and is quite busy on c.w. traffic nets. K6BGM won the women's code contest at the Pacific Division Convention. FKY is back in Fresno after a trip to Florida and Michigan. GQZ and EXH are installing 75- and 40-meter mobile in their brand-new car. ZIJ made 2400 points in two hours during the last C/D Party. YWH has been heard on 75 meters with a nice-sounding mobile. Traffic: (July) K6FAE 1444, W6TTX 102, K6BGM 25, W6FEA 22, GIW 22, SJJ 22, ZRI 17, EBL 15, WJF 8, K6BMM 2, W6BCY 1. (June) W6SJJ 82. (May) K6FAE 1502. (Apr.) K6FAE 636, W6FEA 25, WJF 16.

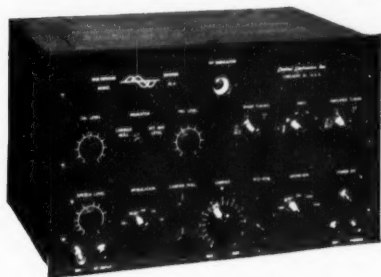
## ROANOKE DIVISION

**SOUTH CAROLINA** -- SCM, T. Hunter Wood, W1ANK -- A transmitter hunt was conducted by the Columbia amateurs and the Charleston group on July 18th. The transmitter was well hidden by FFI and ZRH on Goat Island on Lake Marion, some 60 miles from the two cities, and was operated on 3930 kc. The transmitter, located by HMG, within three hours after starting time, used the Charleston call H110 and was operated by emergency gasoline generator power supply. The following participated: ANK, CEL, CSP, DNR, EDQ, ERG, FFH, HMG, HSM, MBR, NTQ, SWT, SZG, TFE, UOQ, WIQ, WNY, WSA, ZRH, and 81ZO/4. FM took his portable rig to Alabama again during vacation to find his 80-meter antenna gone so he operated on 40 with good results. GCB reports from Sumter that WN4GCA is active on the 80-meter Novice band. GLH soon will be on 80-meter phone and c.w. with a new Globe Scout, and GCB has his Conditional Class license and is on 80- and 20-meter c.w. with a Heathkit transmitter and VFO. PED is active with a 30-watt fixed rig and 40-watt mobile on 75 meters. AUL reports from Florence that LHH now is mobile with a Babcock transmitter and Gonset Super Six and TSU has a 300-watt mobile rig on 75 meters in the trunk of his Ford. RXJ has moved from Florence to Nashville, Tenn. CPZ has moved to a new home and has a sixteen-element beam on 2 meters. Traffic: W4IZI 67, ANK 23, FM 8.

**VIRGINIA** -- SCM, John Carl Morgan, W4KX -- With deep regret we record the passing of CA, one of Virginia's pioneer amateurs and for many years SCM. The lively Richmond gang announces sponsorship of the Roanoke Division Convention. See you in Richmond Oct. 30th. The SVARC held another successful hamfest Aug. 1st at Dickey Ridge with some 250 attending. DXers had a chance at another "country" when Virginians QVW, VZQ, and WN4HBC went on a DXpedition to Nevassa Island in the Caribbean as KC4AB, WN4CHK, high scorer in the 4th call area in the Novice Roundup, is planning to take the General Class exam. YVG reports having acted as checkers for the motorcycle run between Norfolk and Natural Bridge. We'll miss ESK, soon to be signing 7ESK from Washington; UD, who's moving to W6-Land; and ATA, now in Florida. YZC, running 150 portable in North Carolina, says he will be back for the VN/VSN regular season. HQN and UBC visited the SCM en route through Winchester. The feminine contingent is urged to send YL items to BLR. Kay is writing a fine YL column for the Virginia Bulletin. PNK has licked TVI and now can run a half gallon. GF has a new switcheable 5-band antenna tuner and is working on 3-band vertical for DX. By the time this appears the fall net season will be underway. If you like traffic-handling, you're urged to report into any or all nets. Even though you may not consider yourself a "hot" code man (or gal) as a try at reporting into the c.w. nets. You're most welcome, and all hands are more than willing to QRS if needed. A list of "QN" signals is yours on request to the SCM. Traffic nets, frequencies, times, and days are as follows: Va. Phone Net. (VFN) 3835 kc. 7 p.m. Daily; Old Dominion Net (ODN) 3845 kc. 1300 Mon.-Fri.; Va. C.W. Net (VN) 3680 kd. 1900 Mon.-Fri.; Va. Slow Net (VSN) 3680 kc. 830 Mon.-Fri.; Va. Overdr Net (VON) 1820 kc. 1900 Mon.-Fri. Traffic: (July) W4BLE 83, KN 64, YVG 37, DWP 22, TYC 22, LW 16, OWV 11, ZFV 11, IF 5, TFX 4, UWS 4, ZYV 3, JUJ 2, CHK 1, CKI 1. (June) W4RJW 57, KRR 46, UHG 18.

**WEST VIRGINIA** -- SCM, Albert H. Hix, W8PQQ -- IRN has a new Viking Ranger. DIE is working good DX on 14 Mc. The Richmond Amateur Radio Club is sponsoring an

(Continued on page 100)

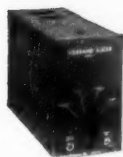


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Wired and tested..... \$249.50  
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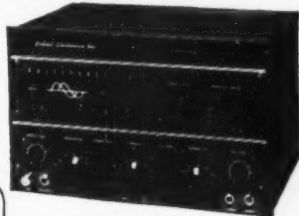


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Official Roanoke Division Convention for the week end of Oct. 30th. I hope some of the West Virginia gang can attend. QHG is putting up a new 10-meter three-element beam. BK1, of Charleston, schedules 4PCT and 8LPD successfully on 2 meters. CHF is back on all bands with a Viking. NYH is putting up new long-wire antennas. KDQ is so QRL with work that he has not been too active lately. ETE had his ham station on demonstration at the St. Albans hobby show. TYG is a new OPS and has a new three-element rotary on 20 meters. RKV will be back on soon with a new Viking Ranger and 813 final. ZJS is doing a good job working 75 meters with his rig. PQQ, CLX, and HZA worked F8FW/FC in Corsica. HI continues to work good DX on 6 meters. Traffic: W8AUJ 146, MBA 56, NYH 56, HZA 43, GEP 41, KDQ 25, DFC 17, PQQ 6.

### ROCKY MOUNTAIN DIVISION

**COLORADO** — SCM, Karl Bruggeman, W0CDX — SEC. MMT, SGG is back on the air after a long absence. He is running a 6L6 for 30 watts on 80, 40, and 20 meters. 7BVZ visited LZV in the Springs. LCE and CNM are active in Grand Junction on 2 meters. MGX is driving a Crosley. He'll have to go v.h.f. to get an antenna that will fit. LCE has been recommended to the City Council as Civil Defense Director for Mesa County. KHQ has been transferred to Avondale and will be off the air for an indefinite time. He has turned over the RM duties to RTA temporarily and will be absent from TCC. OXS recently was given a homebrew rig running 350 watts. KQD continues to be active in traffic as chief operator of RTA, which has made BPL for 8 months in a row. Irene's OM, ex-WN0QXR, is busy on the antenna tuner and Paratone for their new 813 rig. MMT reports that we need Sterling and Pueblo to round out the EC coverage for all mutual aid areas. We now have almost all areas covered with the appointments of RQC in Craig and WJR in Durango. Now, if we could get good attendance in both the National Traffic System and the State nets, we will be all set. Things should pick up this fall but believe me, fellows, we just have to make out those ORS certificates. Also by getting more operators on the nets, we can spread around the load and make it easy on all. Traffic: W0RTA 705, K0FAM 613, W0UUF 69, MFF 19, IA 10.

**UTAH** — SCM, Floyd L. Hinshaw, W7UTM — BSE, is back from vacation in Los Angeles where he visited 6LRC atop Mt. Wilson. JVA heard several touring bands on 2 meters as they drove through Salt Lake City. CCC has a new Viking Ranger which he used in the July C/D Party. GPN, EWX, SP, and TCC, the RACES faithful, maintained regular drills throughout July. Let's more of us participate, for practice has never hurt anyone. 6TUV/7 visited UTM for a few hours this month. It was a pleasure to meet Bob, just sorry he had to rush.

### SOUTHEASTERN DIVISION

**ALABAMA** — SCM, Joe A. Shannon, W4MI — New appointments: USM as ORS and VTY as OO Class III. We welcome the following newcomers to the section: WN4s HGE, Childersburg; HML, Demopolis (XYL of TLV); GOT and FNP, an OM-XYL team in Mobile; HFK, Northport. HKK is on 75 meters in Montgomery. GOT and FNP were students of AAN. Audrey has started a new code class with eight students. She also has received a certificate for having worked 25 stations in New Orleans. She reports it is the second such certificate to be issued outside the city. New club officers: Montgomery — GDU, pres.; AUP, vice-pres.; and TOG, secy-treas. Tuscaloosa — WYN, pres.; MI, vice-pres.; and TXM, secy-treas. BFX, Selma, now has General Class license and 50NL/4 recently acquired an Extra Class ticket. TXO has taken up printing as an additional hobby. WOG is sporting a new B&W 5100. AENB needs more members for better state coverage. The net meets daily at 1900 on 3575 kc. About 25 stalwarts from Alabama attended the Northeast Mississippi Hamfest. Traffic: (July) W4WOG 569, KIX 219, TXO 47, AAN 45, USM 43, TKL 22, DXB 12, RNX 11, AZX 9, OAO 1. (June) W4YRO 76, UHA 55, AAN 49, W5ONL/4 39, W4PWS 15.

**EASTERN FLORIDA** — SCM, John W. Hollister, jr., W4FWZ — Don't forget the S.E.T. is scheduled for Oct. 9th. Also this month an AREC test is scheduled for the Jacksonville Area. The big activity for July was the communications furnished for the Gold Coast Marathon by the Flamingo Net. According to MVR/SDI it was a job well done by all, with orchids to both fixed and mobiles. The net big deal was the No. 1 issue of the Flamingo Net bulletin, *Bird Sparks* and hats off to VGV for a swell job. Holly Hill: A new Novice is WN4HNV. AYD reports good activity on 21 Mc. Jacksonville: WEO is ORS. DSC is experimenting with grounded vertical. BMY was in to see ye SCM. Lake City: YNM also will teach radio in high school. Novices CYF, CYG, CYH, EGS, EGV, and EGY are lining up a club at the high school, Miami. Lightning struck with plenty of damages at SDH MVR's, but luckily there were no personal injuries. IEH says the Dade Club is using identification badges at its meeting to keep up with voting eligibles. WSJ's Senator Claghorn hat (by ERK) will become famous. PQ is trying out the "Mini" beam. (Continued on page 102)



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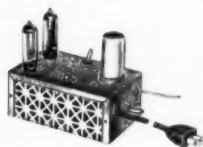
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ABU, on 28 Mc., uses 32V-3 plus 5-element. NQN's s.s.b. DX is gathered on 14 Mc. DRD made BPL again. PBS (and UTW) are experimenting on 400 Mc. with converted surplus gear. St. Petersburg: EYL and WMC demonstrated antenna data with a 140-Mc. set-up and various types of antennas. JCU was plenty complimented on the successful St. Petersburg Hamfest. As everyone well knows by now, the Southeastern Division ARRL Convention is scheduled for St. Petersburg in 1955. Tropical Net: ZQL is doing a swell job filling in as NCS for TJU and the gang ran up 113 messages for July. Traffic: (July) W4DVR 268, DRD 204, IM 199, PZT 139, WEO 93, LAP 73, LVV 68, IYT 40, RWM 29, WS 23, TJU 20, PBS 19, FSS 16, AYD 14, ZUS 6, FWZ 5, WEM 2. (June) W4PJU 506, LVV 38. (May) W4LVV 25.

**WESTERN FLORIDA** — SCM, Edward J. Collins, W4MS/RE — SEC: PLE. We welcome W4HJU and W4HJW to the section. BGG is putting the Viking Ranger together. GMS is hot for 144 Mc. FDL keeps the gang pepped up at Grices. MUX is doing an FB job with his copy in *Paraspace*. VR still is loyal to 40-meters c.w. PQW has moved to "Harmonic Hollow." PAA has been in the hospital. HJA has a Barker-Williams transmitter. DAO, DEF is getting the Pensacola Amateur Radio Club transmitters going in the new club house. CCY donated an HRO to the Club. Ex-MUN has offered an HT-9. QK has finished new operating rooms. Ex-ASV passed through on his way to Europe. EZT donated gear to the Club. YFH and BGG are busy getting the Pensacola High School Radio Club set up for 1954-55. ZFL is vacationing in W4-Land. ZUN is reworking Command transmitters. MS is plugging along with TV rig and has three image orthicons. NN, AOK, and JM work during the day within a 20-ft. radius. The following are in the Eghn Emergency Net: SRX, with KWM as operator, BKZ, AOK, ROM, NN, MYE, RKH, SMM, CAY, JM, YBU, VYU, WKG, LDH, TDC, PLE, U-SW, and CPE. YFG, YFH, YEF and GCX are very active in emergency work in the Pensacola area.

**GEORGIA** — SCM, George W. Parker, W4NS — SEC: OPE, PAM, LXE, RM: MTS, OGC. Nets: Georgia Cracker Emergency Net, 3995 kc., Sun, 0830; Tue. and Thurs. at 1900 EST. New ECs are RTY, Stephens and adjoining counties; DQM, Atkinson and adjoining counties; BBQ, Spaulding and Butts Counties; KR, Tourist and adjoining counties; YWP, Dougherty and adjoining counties; HRA, Camden and adjoining counties. All amateurs are urged to contact their EC and make application to join AREC. New officers of the Georgia Cracker Club are ACH, pres.; CFI and DND, vice-pres.; MZO, secy-treas.; and NS, historian. A new club has been formed at Barnesville. FYC is president. GS is a newcomer in Rome. HHH is a new Technician in Atlanta. CAZ is being transferred to Long Island. BWD, the XYI, of ZWT, now is General Class in Augusta. TJS is the new RACES Radio Officer for the State of Georgia, and will provide applications for those who drop him a card. FCW, in Cordile, is sporting a new rig with a pair of 4-125s. NS now is mobile. IPL is putting up some new sky hooks on his antenna farm. OCG is a new RM for 80 meters and is laying plans for a section c.w. net to start in the fall. Contact him in Augusta if you are interested. By the time you read this our hot spell will be over, so drop a line to your SCM and let him know what is going on. Traffic: (July) K4WAR 1384, W4USA 1020, CAZ 184, IMQ 170, ZWT 51, MTS 28, MA 26, BWD 9, NS 8. (June) W4USA 1248, MTS 18, KSZ 6.

**WEST INDIAS** — SCM, William Werner, KP4DJ — SEC: HZ. We regret to report that DZ and RJ are now Silent Keys. Our sympathies to ES on the loss of his mother. PW, commanding officer of the National Guard Medical Corps, is on active duty at Salinas. VK acquired a Viking II. WU left for Burlington, Iowa. UT and AZ put up Windom antennas for 80 meters. SW, ZL, and ZY are new stations on the 3925-ke. Net. W2CZU KP4 is running a kw, while waiting for his KP4 call. W5BDK KP4 is running mobile. WT, Dona Maria Luisa, now General Class, is on 75 meters. WR joined the ARRL. ZO is the call of the NAS Radio Club. W4IWS and W4IWF are now KP4s. JM put up 80-meter antenna with coaxial feed. DJ bought a TV receiver and now is QRL eliminating TVI from the VFO. YN is a new YL station at Fort Buchanan. TZ, in the Signal Corps, is waiting Army transfer. W4IYT is preparing for the General Class exam. ZN put up 15- and 20-meter beams. WD put up 50-foot steel tower for his beams. The Antilles Net, on 3865 kc., still is going twice daily seven days per week. CK's son is studying for his General Class license. AAB is having loading troubles with pi coupler. The May-ore of San Juan sent a letter of thanks for the amateurs' participation in civil defense tests. Traffic: KP4ZW 356, DV 8, DJ 2, ZD 1.

### SOUTHWESTERN DIVISION

**LOS ANGELES** — SCM, Howard C. Bellman, W6YVJ — One of the big items of news this month was the July meeting of the quarterly traffic breakfast with JQB as chairman. It appears that the L.A. Section Net, as such, should be disbanded in favor of a Southern California Net, similar to the old SCN. The idea seems to have stemmed from the Pacific Division Convention and is offered in order to stimu-

(Continued on page 104)

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Plug-in adapter for 75A1, with 3 KC mechanical	
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Plug-in 3 KC filter adapter for SP-400.....	65.00
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late traffic in sections where it is very low. The net would operate as a "section-level net." More on this when a plan has been submitted. LYG and HIA were visited by PAWGE. USY worked the South Pole, LU4ZS, AEE demonstrated his RTTY station to the Long Beach Club and also at the Pacific Division Convention. Radio Clubs take notice. K6BWD is sporting a new Gonset two-element "Bantam" Beam, and likes it. BHG, RM of the old LSN, sends Official Bulletins first on m.c.w. then voice on 147.5 Mc., Mon., Tue., Thurs. and Fri. at 1200 PDST. Hank is sporting a new Collins 75A-3 receiver. EBK now has a grounded grid half kw. on single sideband. BMN is running the gamut on 20-meter s.s.b. LVQ reports that VG of Montebello passed away. He was a charter member of the Whittier Radio 50 Club. LVQ operated portable 75, 80, and 40 meters from Yosemite for two weeks. NTN is sporting an automatic transmitter system for his OBS skulls and says he fell asleep a couple of times while sending 10 w.p.m. for Novice, by hand. This slow stuff goes on nightly on 3700 kc. at 2200 PDST. K6EA is acting as liaison for RN6 traffic to MCAN-4 and vice versa. UED is sitting at the mike these days with a new 20-meter folded dipole a half wave high with a bazooka matching section. Anyone interested in Army MARS v.h.f., please contact BHG, 118,010 Mc. has been authorized for San Diego, Los Angeles, and San Francisco. EBK looks like USY is trying for a RPL Modulation. NIE and SCM were portable on Catalina Island in August. ZDO reports that BUT of Taft, is here now with a kw. 3QK1, Sherman Oaks, has a kw. and eighteen-element Yagi. EFS, in Armona, and JJE, in Lemoore, are putting good signals into the San Fernando Valley. BUK and your SCM got acquainted over the telephone and by mail over definitions about OPS. gram won, naturally. I just didn't realize that traffic isn't a hard OPS requirement. BMM's definition of a television tube is, to wit, a "modulated milk bottle." NIE reports that he, UTX, UTC, BSD, and NYL were among those who stood by waiting to assist the Raft *Leki*, in the Pacific, in July. Traffic: (July) K6FCZ 1387, FCY 827, W6LYG 646, USY 288, K6EA 122, BWD 66, W6BHG 61, QRS 48, CMN 36, TLD 13, GJP 10, CJE, EBK 6, BJK 6, AM 1, HIF 1, PZN 4, K6BEQ 2, W6NTN 1, JUNE K6FCZ 1276, W6LYG 722, MBW 58, K6BWD 35, W6NTN 12.

**ARIZONA** — SCM, Albert H. Steinbrecher, W7LVR — Asst. SCMs: Kenneth P. Cole, 7QZHX; Dr. John A. Stewart, 78X. SEC: ARB. PAM: KOY. Arizona Phone Net: Tue. and Thurs., 7 p.m. 3865 kc. Arizona C.W. Net: Tue. and Thurs., 8 p.m., 3600 kc. July was unusually quiet, with very little activity around the Stargazer. However, PJY reported that the Winslow and Williams groups handled the communications for the Powder Puff Derby with a portable rig at the airport, and relayed messages to 61NQ via BFA and YZU. The following participated: APE, BFA, GZR, LJJ, LYS, PJY, REO, and YZU. New Novices: VYL, VYK, and VYL. New General Class: VZH and VZE. Tucson had a transmitter built with MGE and UCX lost in the Catalina Mountains. DRQ found them after an hour's hunt. The following participated: DRQ, HUV, PEG, QHD, QHT, SPK, and LVR. PJY has a new Elmac Transceiver and receiver as portable mobile.

**SAN DIEGO** — SCM, Don Stansifer, W6LRU — Asst. SCMs: Tom Wells, 6EWU; Shelley Trotter, 6BAM; Dick Huddleston, 6HJN; SEC: VET, ECS, BAO, BZC, DEY, DSN, FJJ, HJQ, HIE, JBS, KSL, KUY, and WYA. RM: ELQ. DEY is working Santa Barbara regularly on 2 meters and now is able to put in a signal in San Diego with a new beam. He also is active again on 420 Mc. OZO is a new OBS in Newport Beach. TA3AA now is in San Diego signing 60ME. OAJ has a new NC-183. San Diego County members of AREC in Vista, Fallbrook, and Ramona are receiving equipment through c.d. The Helix Club, which is 100 per cent ARRL, had 100 per cent attendance at its August meeting. CDR made 45,496 points on c.w. in the July CD Party. K6DBG operated Net Control for the sports car races in Orange County from Santiago peak on 10 meters and reports 12 mobiles were in operation. New officers of the Coronado Club are K6BGO, pres.; K6AQO, vice-pres.; KSL, secy.-treas.; K6AWZ, corr. secy. With regret we note the passing of two San Diego area ham operators, Glen "Sandy" Sanders and WWP. Tom Parker, KWD, was the vice-president and station trustee of the Rohr Communicators and passed away suddenly from a heart attack while in QSO. SYA and son enjoyed an FB fishing trip in the High Sierras. MJJ is putting out bulletins three nights a week on 144 Mc. WNN has returned from a vacation to KL-Land via VE7 and VE8 and is telling some pretty long tales of the trip. Traffic: (July) W6JLQ 662, IZ1-300, FCT 37, K6DBG 26, W6HIV 7, CRT 3. (June) W6JAB 3545.

**SANTA BARBARA** — SCM, Vincent J. Haggerty, W6IOX — K6NBI sent in a traffic report via radio. K6CRJ received OES appointment; his initial report indicates activity on the Mission Trail Net as well as experimenting on 2 meters with a new rotor beam. A QTH change of 75 feet by LB necessitated a transfer of all his antennas that distance. In 5 hours of the July CD Contest K6ATZ garnered 99 contacts in 43 sections. The Paso Robles Radio Club has acquired the call LKF as a memorial to John Derby, the late founder of that club. Traffic: (July) K6NBI 66, CBJ 7, W6LB3, K6AUZ 2. (June) K6CST 298, W6QIW 82.

(Continued on page 106)

# tv<sup>i</sup> PROOFED\*\*

## Certified Field Measurements\*



Actual measurement of radiation using RCA field intensity equipment. Note close proximity of TV antennas without TVI.

TVI Proofed. What does it mean? Below are excerpts from Certified Field Intensity Measurements using factory calibrated commercial measuring equipment of Eldico TR-1TV amateur transmitter.

\*Copies of the certified report available upon request to Dept. Q.

\*\*TVI-proofed means special circuitry, shielding, and filtering to eliminate spurious and harmonic energies that result in television interference.

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### EXCERPTS FROM FIELD REPORT

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Power input—300 watts  
(1500 V.D.C. at 200 ma)  
Modulation—100 cy tone—100% A.M.

#### Antenna

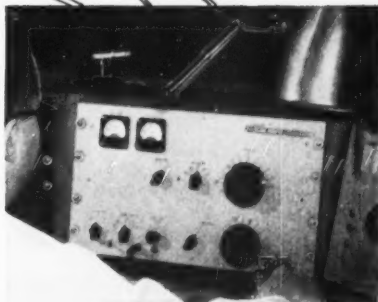
3 Element rotary beam  
52 ohm coaxial feed

#### Measuring Equipment

RCA Model 301  
RCA Model 308

#### Results

Fundamental—14,250 KC—750,000  $\mu\text{v}/\text{m}$   
2nd Harmonic—28,500 KC—132  $\mu\text{v}/\text{m}$  (75 db, down)  
3rd Harmonic—42,750 KC—107.5  $\mu\text{v}/\text{m}$  (77 db, down)  
4th Harmonic—57,000 KC—32  $\mu\text{v}/\text{m}$  (87 db, down)  
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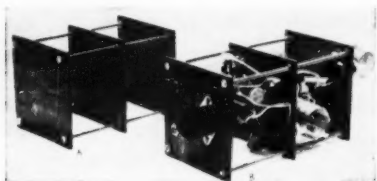


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## WEST GULF DIVISION

**NORTHERN TEXAS** — SCM, T. Bruce Craig, W5JQD — SEC: RIM, PAM, IWQ, RM, PCN, QHL, TSP has moved to our section. AHC is planning an 81 rig. ROH and TGZ have a new QTH in Albuquerque. DTD and his XYL, WN5FDR, have a new VFO. UKO is a student at Oklahoma A&M. VYY went to Carlsbad Caverns. LGY has a new 100-ke. frequency standard. HBD has motor-driven tuning slug in 75-meter mobile antenna. WNK has 2-meter rig started. NOR again is active, this time from Levelland. DLG has a new Heathkit VFO. AWT now lives in Dallas. San Angelo announces a new club with WNV, pres. TGV has 36 countries toward DXCC. CTB is getting married. TGV, EZR, EAR, and EAT had a picnic at Lake Nasworthy with plenty of ham gear along. VID reports an impromptu hamfest with VYY and GZU at Bonham. Those visiting were W1VRY, WN5FJB, W5s VID, TYG and his XYL, TKM. MBP reports that the Elmae transmitter with 160 meters has boomed 160-meter mobile operation. IGL, UBW, and K5FGI served as a link in communications in the "Powder Puff Derby," Transcontinental Women's Air Race. UHV has announced Amateur Radio Day at State Fair, Dallas, will be Oct. 10th. The Ballenger Hamfest was a big success and tied in with the Air Show at Bruce Field. The Terry County Amateur Radio Club's open house at Brownfield brought hams from as far away as Los Angeles. Congratulations on the new club headquarters. GF has a new Globe King Traffic (July) W5LHW 657, YPI 193, KPB 111, YXR 60, AHC 57, ACK 50, TFB 47, CF 16, TVE 11, HBD 10, ZWR 10, WNK 9, DLG 7, (June) W5YFI 265, PAK 224, CF 45, AHC 33.

**OKLAHOMA** — SCM, Dr. Will G. Crandall, W5RST — Asst. SCM: Ewing Canady, 5G1Q, SEC: CKQ, RM, GVS, PAMs: SVR, ROZ. Thirty counties out of a total of 77 now have EC's. S.s.b. news: Your SCM would like a complete roster of stations in Oklahoma on s.s.b. JET already is on and VEP and WQ have kits. The ACARC Hamfest was well attended, as reported by EHC. UZG is selling out and moving to California. RDI goes Viking. We approve the choice of JYT as EC of Oklahoma County. SCX and the Ardmore gang are building 6-meter transceiver units to plug into any car cigarette lighter and use h.c. antenna for strictly local use. It looks like a good deal. The MARS Hamfest at Ft. Sill was well attended in spite of the heat and your SCM got a tool kit. LKQ, ex-EQ-ADX, joined the Silent Keys via a heart attack. Industrial firms recognizing hams in their companies by furnishing QSL cards are American Airlines and Phillips Petroleum. Traffic: W5GVS 195, QAC 53, PML 47, TNW 45, KY 40, SVR 32, REC 22, RST 22, ITF 21, PNG 21, SWJ 12, VBD 12, EHC 9, FEC 7, CHA 6, MEX 3, G1Q 1.

**SOUTHERN TEXAS** — SCM, Dr. Charles Fernaglich, W5FJF — Let's all attend the West Gulf Division Convention in Kerrville, Tex., Oct. 2nd and 3rd. Many fine activities are being planned for both men and women. Contact Cedric Toler, P. O. Box 624, Kerrville, Tex., for further information. Please note that Sun, Oct. 10th, will be Amateur Radio Day at the State Fair of Texas. Bring the whole family for the entire day. Further information may be had by writing UHV, P. O. Box 6595, Dallas, Tex. The Rio Grande Amateur Radio Club, Edinburg, Tex., Net meets on 7275 ke Sun, at 0900. SZB, RLC, and ACO are building 2-meter rigs. CRA, in Raymondville, also is going on 2 meters. AET is using a Loop Antenna on 75-meter mobile. GYP lost his tower and antenna during Hurricane Alice and SZB lost his 15-meter beam. BFS has a new Elmae on the air. MBP keeps the receiver on 3860 ke. for any mobiles passing through. The Club had a hidden transmitter hunt and picnic Aug. 1st. SZB is president of the Club. KSW is recovering from a recent illness and was in Houston recently. As usual he and FJF swapped some equipment. MN is the most consistent traffic man in Southern Texas and he is one of the top in the U. S. He works H&B on 7150 ke. in the A.M. and KC6FPA in the A.M. He ragchews about 5 per cent of the time. I am proud that he was one of the men who helped me to get started in amateur radio. I recall that he had 852s in those days and a regenerative receiver and was a traffic man then. URU has been rebuilding his rig and has a nifty new VFO and driver. Your SCM, Dr. C. Fernaglich, FJF, has been nominated for director by a group of outstanding amateurs in Southern Texas. It is very important to review the qualifications of all candidates and vote for the one who is willing and able to do the best job. Be sure to vote. CA and BHO have announced that they also are candidates. FJF has his new rig on the air. Look for him around 3900 ke. He is anxious to contact all of you. Traffic: W5MN 1280.

**NEW MEXICO** — SCM, G. Merton Sayre, W5ZU — SEC: KCW, RM, JZT, PAM: BW, V.H.F. PAM: FBP. New Mexico monitors 3838 ke. daily in addition to the Breakfast Club from 0700 0900 daily and NMEPN at 0730 Sun., and 1800 Tue. and Thurs., all on 3838, Vallecito Lake, northeast of Durango, Colo., was the scene of a get-together by 81UF, L.F. PGM, WJR, 7NHH, NZB, UNK, 5CIN, PBV, POL, SB, and ZLF on July 4th. It seems the W0 boys were straining the ether by pulling a.c. current out of nowhere for their hot plates until they located an REA line nearby. 5CIN, 7NZB/5, and 5PBV, in three mobiles.

(Continued on page 108)



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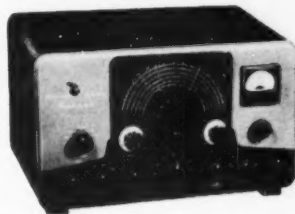


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provided needed communications between Farmington City Hall and the reservoir during the local emergency. PRE has a Communicator II. NUN installed Master Mobile all band antenna. YPC and BCO have new NC-98 receivers. NSJ has portable 420-Mc. equipment (10 watt output) with 48-element beam ready for field checks. FAG is using new e.c. 420 converter with 32-element beam. BIH is very active in the CAP and enlisted BXP in Rudown. KCW is our new SEC, so all ECs should forward monthly reports to him. A watermelon feed held at White Sands National Monument July 17th was enjoyed by about 80. YBI and BIW won prizes. RFJ and RYK are going to Bavaria for three years. Traffic: K5NRX 75, W5CEE 21, B2B 20, ZU 17, BAC 14, RFK 14, HJF 12, VNZ 12, BOG 11, BTB 11, BXP 11, BZA 10, VDY 6, FRP 5, WBC 5, OIA 4.

## CANADIAN DIVISION

**MARITIME** — SCM, Douglas C. Johnson, VE1OM — Asst. SCM, Fritz A. Webb, 1DB, SEC. RR, ECs VE1DQ, VO6U, PAMs: VE1OC, VO6N, VO6S is a new ORS appointee. We regret the resignation of EK as EC for Halifax. Recent visitors to VE1 were VE2PZ (ex-1HK), VE2VV, VE3BZB (ex-1BK), W1RSE, K2CHQ, and GM8MN. HM has moved his QTH to Sussex. ABW is active from Whitehead, N. S. Mary, formerly ZM, now is ME. Active during the July C.D. were E1K, ZZ, GD, W4KVM, VO6, VO6N, and VO6U. The Charlottetown Club station, H1, is active and should prove popular to those seeking P.E.I. for WAVE certificates. VO6U and the Goose Bay gang have organized a new AREC there. Doug reports 9 full members and 2 supporting. Is your community prepared for any emergency? Contact your SEC, RR, who will forward information on AREC. VO6N reports the *Blue Dolphin* QNI the Labrador Net. VE1PB has new broad-band converter for 75-meter mobile. W4KVM/VO6 is getting good results from 20-meter ground plane. VE1s please note: The Newfoundland Net meets on 3750 kc. daily from 6:30 to 7:00 P.M. Please cooperate in keeping this frequency clear if at all possible. VE1s QL, ZD, and DK were temporarily located at RCAF, Greenwood, instructing cadets. Traffic: VO6N 320, VE1FQ 314, VE1YF 142, VO6S 89, VO6E 71, VE1UT 46, VE1ME 44, W4KVM/VO6 7, VE1OM 6, VE1DB 2.

**ONTARIO** — SCM, G. Eric Farquhar, VE3IA — BCL has moved to London and DIG to Montreal. DFE and DSQ are Chas. A. EAB painted the tower and says he awaits winter. AVS is hounded by his family to go mobile! AUU snuggled Y12DI on 14 Mc. The new 220-Mc. beam at CAB works fine. The Gateway Amateur Radio Club gave valued assistance to the RCAF, Northern Air Show last June. Mobiles and portables were furnished by the Club to direct and control some two thousand automobiles into five parking areas. A letter of appreciation was received from the Chairman of Grounds Committee, with the rider that amateur radio would be called upon again next year. H. F. Proctor, a shut-in of Toronto, became interested in amateur radio last March and, following inquiries as to where assistance might be obtained, found staunch and willing friends in the Scarborough Radio Club, who provided him with an oscillator and instructors, and the Department of Transport, who visited his home and conducted the necessary examination. The result is that DVI is a new call in our section. He extends deepest gratitude to Bill Ricker, the R. I., DAQ, and DUY for their untiring efforts. DRY completed a tour of duty with the Dept. of Lands and Forests. Estimated attendance at the North Bay Hamfest was about three hundred. The Ontario Phone Club, we understand, held a mobile picnic at Collingwood recently. Please let's have reports of your doings, fellows. In being returned to the office of SCM for another term I extend sincere thanks for the fine support. Likewise to NG, my worthy opponent, goes thanks for his radiogram pledging continuation of support. Traffic: VE3TM 117, GI 95, ATR 59, BUR 50, NO 50, IA 49, AJR 40, DQX 32, AUU 20, AOES 8, VZ 3.

**QUEBEC** — SCM, Gordon A. Lynn, VE2GL — This report covers June and July. It is with regret that we record the passing of two of our tanks. NV, very active from Sorel, died suddenly in July 19th, and Abbie Georges Desjardis, ex-VE9AB, who transmitted nurse in 1912, died June 29th at the age of 88. BE and CA attended the North Bay Hamfest over the July 1st week end, and CA had GM8MN as a visitor, after having worked him for 20 years. ZC has 25 watts on 75-meter phone. YA has 500 watts on 20, 40, and 80 meters. BV is looking over the antenna situation. XX, on 75-meter mobile, made a trip through VE3-Land, visiting VE3DIX, BPG, ALX, BBH, ALN, and Bill Ricker. The 2nd operator from YV5BY was a visitor at WW's and the Lakeshore Radio Club August meeting. YP is active on 3790-ke. phone from Valleyfield. ALZ is mobile on 10 meters with 3 watts. QC, formerly VE1BF, skeds the Maritime Net on 75 meters. WW has 100 countries confirmed on phone. ABL is moving antenna poles to a new QTH. GQ is visiting YV-Land. ABZ is among the mobilers. EC, AEM, KJ, AOB, ACP, and APP sked daily at 0830 and 1300. AUB is a newcomer. ADU now is endorsed for phone. DR reports that PQN operated a skeleton net during the summer. BR was on from Dumay during the summer. Reports are solicited from the Quebec City and Hull Areas as well as from others.

(Continued on page 110)

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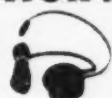
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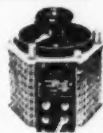
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Traffic: (July) VE2DR 42, CA 39, EC 22, YA 2, (June) VE2CA 54, EC 14, BK 5, (May) VE2DR 94, BK 1.

**ALBERTA** — SCM, Sydney T. Jones, VE6MJ — A very successful hamfest was held in Calgary on July 3rd and 4th. The executives of the Calgary Club and all those who were responsible for the arrangements are to be congratulated. TK has left our fair Province for parts unknown. We wish him good luck and hope those greener fields to the south really pay off for him. WC was top traffic man for the month. It seems the new 20-meter folded dipole is working FB. YE reports an interesting trip south of the border and an FB time at the International Hamfest. OC has been confined to the hospital. We are all pleased he is able to be up and around again. BN, XD, YE, EA, CE, YZ, and MJ were among out-of-town visitors at the Hamfest. We understand that WT (Oliver Wilson) has been appointed Radio Officer for the city of Calgary, to replace TK. Gang, your cooperation is needed if you wish to have Alberta news reported in QST each month. In the past two months very few reports have been received by your SCM. Please let me hear from you either by mail or over the air. Traffic: VE6WC 80, OD 39, MJ 10, YE 6.

**BRITISH COLUMBIA** — SCM, Peter McIntyre, VE7JT — July being part of the holiday time activity is at a low ebb, with many away on vacation. The hidden transmitter hunt still is the prime pastime for the mobiles with a new wrinkle added, that of coming in last for yours truly. Green glasses and green foliage don't make for good hunting, much to my consternation. Evening mobile hunts are being tried so that those who cannot get out on week ends can load the family in the jalopy and take an evening jaunt for a couple of hours without arousing the ire of the XYL. ZF has been elected secy-treas. of the Okanagan International Hamfest for 1954-55. RR provided contacts to Australia and New Zealand for some of the athletes of the B.E. Gang. BI still maintains that the mobile antenna whip makes a good fishing rod, if the fish are there. Keep your ear peeled on Wednesday nights on the AREC Net because after the traffic and net business is cleared there is a period for swaps. Go through the junk box, leave the junk, and offer the rest for swap for something you need. What's happened to the gang in the Northern Section? They used to be quite active but lately they have been conspicuous by their absence. Come out of the igloos, fellows, and melt the ice of the antennas. There will be no report next month as your SCM will be mobiling through W7-W8 and W9-Land as well as VE3- and VE2-Land. Traffic: VE7QC 86, ZF 74, DH 21, ZV 15, XY 2.

**MANITOBA** — SCM, Leonard E. Cuff, VE4LC — On behalf of the Amateur Radio League of Manitoba, Inc., I wish to extend a most hearty vote of thanks to all those hams and SWLs who so generously gave of their time and effort in manning the amateur radio station at the Red River Exhibition at Winnipeg July 24th to 31st and to all those who stood by at their home stations to help handle traffic. About 38 licensed hams and their families journeyed to Grand Forks, N. D., for the Hambooree held there July 18th. The weather was ideal and a good time was had by all. Our congratulations to the Sioux Amateur Radio Association for a job well done. LC and his XYL took a trip to Carman recently and spent a very enjoyable afternoon visiting with JK and LS at the CRW transmitter site. SR and his XYL spent a few days holiday visiting at Morden and Haskett, Man., and at Grand Forks and Fargo, N. D., and to finish it up a week at Gull Lake. IF has been spending the summer teaching the deep dark secrets of radio to members of the RCAP. New calls this month are PE, AW, FS, JG, and ND. Traffic: VE4AI 78, IF 53, GE 50, HL 32, NW 16, JM 15, MK 10, RB 10, FF 7, MO 7, AO 6, RK 6, BD 1, JY 4, VE5GO 4, VE4GB 2, YR 2.

## 2-5 Strays

As if Punxsutawney were not enough, W3DVB points out that the fabulous figure referred to on page 30, Sept. QST, should be the numeral *one* followed by 1700 zeroes, or the number 10 followed by only 1699 goose eggs.

W0WET received a landline call from W0LYP across town requesting him to listen on forty for the W0LYP rig. W0LYP made his test call on an apparently clear frequency but before W0WET could reply, back came W2HIZ with a bewildered interrogative. It turned out that W2LYP and W2HIZ were making a similar test on the same frequency.

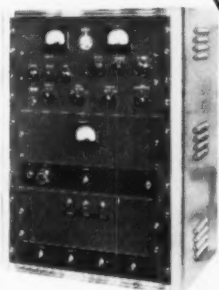




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W0CFQ

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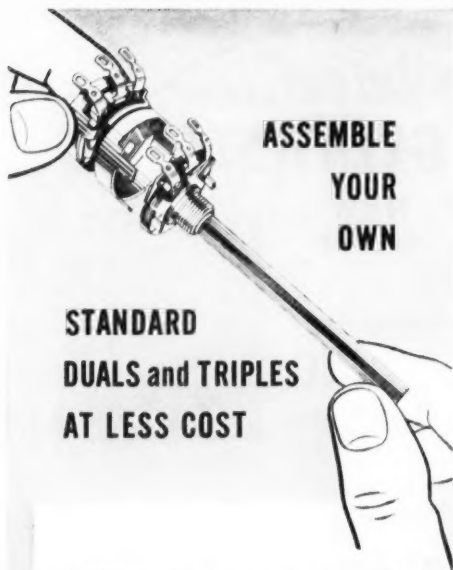
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### R.F. Assembly

(Continued from page 15)

the gang-tuning control. Resonance at 3.5 Mc. should be found with the ganged tuning condensers set well toward maximum capacitance. Resonance at 14 Mc. should occur at about 75 per cent of maximum capacitance. Resonance at 21, 7, and 28 Mc., in that order, should come at approximately 35, 20, and 10 per cent of maximum. This stage is operated straight through on 3.5 Mc., and as a doubler to 7 Mc., using a 3.5-Mc. crystal. With a 7-Mc. crystal, it is used as a doubler to 14 Mc., a tripler to 21 Mc., and as a quadrupler to 28 Mc. It is also used as a quadrupler in obtaining output at 27 Mc., using 6-Mc. crystals in the oscillator.

At resonance, the plate current to  $V_2$  should be approximately 10 ma., and grid current to the 6146 should run 4 ma. or more on 3.5 and 7 Mc., and at least 3 ma. on the remaining bands.

For testing the output stage, a dummy load of some sort connected to the coax output connector is very convenient. A nonreactive load is preferable. In the laboratory, we used a 52-ohm Ohmite dummy load and a v.t.v.m. with an r.f. probe as an output indicator. A lamp bulb may be used for preliminary adjustments, but it is not entirely nonreactive. Accurate tracking adjustment requires an essentially nonreactive load, either in the form of a dummy, or an antenna that has been tuned accurately to resonance, and matched to a 50-ohm line. Information on such adjustment will be found in the *ARRL Handbook*, and the *ARRL Antenna Book*.

Plate voltage can be applied to the amplifier by placing a jumper between Terminals 3 and 6 of  $J_3$ . Whenever it is desired to cut off the amplifier while adjusting the preceding stages, this can be done by turning  $S_1$  to the central position in which  $S_{1A}$  grounds the screen of the 6146.

Normal grid current for the 6146 is approximately 3 ma. If it exceeds this value appreciably, excitation may be reduced by detuning  $C_2$  in the oscillator circuit slightly to the high-frequency side of resonance. As a result, the lamp bulb may detune the final so far that it will be impossible to peak both driver and final simultaneously unless the shaft coupling is loosened and the two condensers adjusted independently. With  $C_5$  set at half capacitance, and with proper excitation applied, the meter switch should now be turned to read amplifier plate current, and the gang control adjusted to resonance as indicated by the dip in plate current. The loading should then be adjusted, by means of  $C_6$ , so that the plate current at resonance is as close to 100 ma. as possible.

With the gang control adjusted accurately to amplifier plate-current dip, the meter should be switched to read the grid current of  $V_3$ . If a readjustment of the gang control is necessary to obtain maximum grid current,  $C_5$  should be re-adjusted slightly, and the process repeated. If the load is not too seriously reactive, an adjustment of  $C_5$  should be found where maximum grid

(Continued on page 115)



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current and minimum plate current occur at the same setting of the gang control. So long as the load is very close to resistive, this same adjustment should hold for all bands.

The adjustment and feeding of radiating systems to present a resistive load are discussed in the antenna chapters of *The Radio Amateur's Handbook* and *The A.R.R.L. Antenna Book*.

Incidentally, there are many who may favor limiting the power-supply voltage to 300. At this voltage, an input to the final of 15 to 20 watts is usually the limit, and the modulator need supply an output of only 10 watts or so. In this case, a smaller modulator would be satisfactory, and might be included as an integral part of the r.f. assembly, making use of the vacant spaces reserved for this purpose at the rear corner (both sides) of the chassis.

For those who may be interested, work has already been started on a modulator for this transmitter. It is anticipated that the assembly will be considerably smaller than the r.f. unit, and that it will deliver approximately 25 watts of audio. A description of this modulator will follow in a subsequent issue of *QST*.

## Step-by-Step Transmitter

(Continued from page 19)

critical, and it need not be right on the nose so long as sufficient grid current is developed under actual operating conditions. See voltage and current information given later.

Neutralization of the final stage is the next step. The metal mounting clip of the neutralizing capacitor,  $C_4$  in Fig. 1, is soldered to the stator post of the plate tank capacitor,  $C_2$ . The movable element should be set at the point where tuning the plate condenser through resonance causes no change in grid current.

Connect the plate supply directly to Pin 4 and Pin 7 and run the metered lead to Pin 8 to measure the final stage plate current. Connect a 15- or 25-watt lamp to  $J_1$  for a dummy load, and tune  $C_2$  for minimum plate current. Tune  $C_3$  for maximum lamp brilliance, and retune  $C_2$  for minimum plate current. If the neutralization is set exactly right, maximum output, minimum plate current and maximum grid current will occur at one setting of the plate capacitor.

If the transmitter is to be modulated, the modulated plate voltage should be applied through Pins 7 and 8. Meters may be connected in as many of the leads as you have meters to go around, but it is desirable to meter the plate and grid circuits of the final stage continuously, at least until you have become thoroughly familiar with the way the rig runs. The transmitter may be run from a single 300-volt supply, or if higher power is wanted the final plate and screen may be supplied from a separate

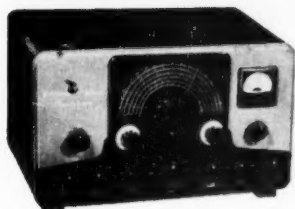
(Continued on page 116)

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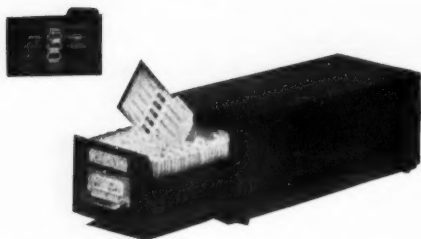
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source of up to 500 volts. Operating conditions are about as follows: With 300-volt supply the final plate current will be about 50 to 60 ma. under load. Off-resonance plate current will be about 70 to 80 ma. At 500 volts the plate current should be loaded up to no more than 75 ma. Grid current will be around 2 ma. under load and the screen current 4 to 5 ma. Plate current to the two 12AT7 stages will be about 15 ma. each. Their plate voltage can be as low as 200 and still deliver adequate drive to the amplifier.

The transmitter may be keyed for c.w. in several ways. The 300-volt leads to all the stages can be keyed with a relay, or the screen of the final can be keyed alone. The cathode of the amplifier may be keyed directly by inserting the key between Pin 6 and ground. This is probably the best way of all, but it cannot be used in the 2-meter rig as the cathode is grounded at the socket.

### Operating the 144-Mc. Rig

Procedure for putting the 2-meter rig into service is very similar to that outlined above. The oscillator and tripler stages are fed from a common power connector pin, so it is necessary to disconnect the 4700-ohm resistor in the lead to  $L_2$  when testing the oscillator. It may be reconnected for testing the tripler, but remember that the meter in series with this pin will now read the current to the first two stages. The doubler stage should be checked in the same way as the others. The position of coupled circuits should be adjusted for maximum grid current in the 2E26, rechecking the trimmer settings if the coils are moved.

The test for neutralization should be made in the same way as for the 50-Mc. rig. The number of turns in  $L_5$  can be altered if necessary for the most perfect neutralization, but this will be found to be quite uncritical as a general rule. Full-load operation will be similar to the 50-Mc. unit, except that there will be an extra 25 ma. drain for the 12AT7 parallel doubler. It is recommended that the plate voltage be held to 400 volts or less on 144 Mc., allowing a maximum input of about 25 watts.

Keying may be done in the amplifier screen lead, or if this does not completely cut off the amplifier additional stages up to and including the oscillator may be keyed. Best-sounding c.w. will be had if the oscillator is operated from a separate source, preferably regulated, and the screen of the amplifier and the plate of the doubler are keyed. When keying in the positive leads use a relay or a shock-proof key.

The screens of the rigs can be supplied from the final plate power source, or if a separate supply is used on the exciter portion this voltage can also be applied to the amplifier screen. There should be a small audio choke in the screen lead, in this case, if the amplifier is to be plate modulated. The power connection system shown allows the power supply problem to be solved in several different ways, to suit one's own set of circumstances. A convenient way to operate the

(Continued on page 118)

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40 meter 7 mc, 68 ft.	5.85
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two rigs is to leave all supplies connected to both, and energize the heater circuit of whichever one is to be used at the moment.

In case you have recognized some of the features in the 2-meter transmitter, we hasten to admit that several construction and circuit ideas were lifted from a commercial unit<sup>2</sup> described recently in *QST*. The plate tank circuit, the interstage coupling method, and the output coupling loop are examples of schemes that were too good to pass up.

[EDITOR'S NOTE: Part II of this article will appear in a subsequent issue.]

<sup>2</sup>"The LW 2-Meter Transmitter," New Equipment, May, 1954, *QST*, page 47.

### "Simple Squirt" Beam

(Continued from page 21)

writer is of the opinion that adding another element would give considerable improvement in both forward gain and front-to-back ratio over the 2-element job without serious compromises in respect to s.w.r. or bandwidth. Keeping in mind the desirability of simplicity and light weight, the construction plans are as follows:

*Boom:* 12 ft.  $\times$  1 1/2 in. or 1 3/4 in. o.d.

*Elements:* Center section 1 12 ft.  $\times$  3/4 in. o.d.

*Telescoping inserts:* 6 ft. 4 in.  $\times$  5/8 in. o.d.

*Coil form:* Polystyrene rod, 1-in. diam., 1 ft. long, 5/8-in. hole drilled 4 in. in each end. Coil form will fit over insert tubing instead of inside. Coil to be wound with solid No. 12 copper wire.

*Match:* RG-8/U and tuned gamma, or 300-ohm line and T match.

These suggested plans for the 3-element beam are included because the time required to do the construction would be difficult for the writer to come by. Some other ham who is cramped for 20-meter-beam space may have the time and the inclination to do the job. If there is such a person or persons, I am sure a report on the operation would be of interest to many.

So far as the two-element job is concerned, it is certain that there is a great deal to be gained over a doublet, in receiving as well as transmitting, and both the OM and XYL agree that considering both performance and appearance, the Simple Squirt is a very happy compromise.

### Volume-Compression Circuit

(Continued from page 29)

vide adequate gain to control the audio variations over a wide range of signal intensities.

The input to the compressor has an *L-C* filter to help attenuate r.f. and a small output coupling condenser on the first stage to attenuate the low audio frequencies. A portion of the output from  $V_{2A}$  is fed to  $V_{2B}$  and thence to the rectifier  $V_3$ . Ripple in the output of  $V_3$  is filtered by  $R_5$ ,  $C_1$  and  $C_2$  before it is applied to the bridge circuit consisting of the impedances of the two diodes of

(Continued on page 180)

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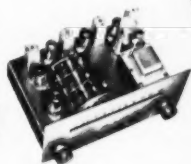
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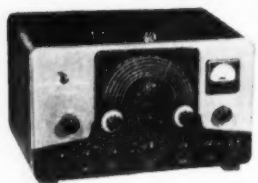
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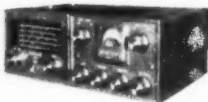
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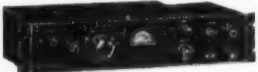
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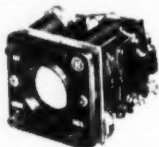
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$V_4$  and the two 150K resistors. Using a voltage-divider network and blocking condenser  $C_4$  eliminates the necessity for using batteries as a voltage source for the bridge.  $R_4$  is used to balance the bridge and should be adjusted to equalize the voltage drops between ground and X and between X and Y. These voltages should be within one-tenth volt of each other. With the circuit values given, approximately 1.25 volts appear on the plates of the duo-diode. It is necessary to use d.c. on the 12AL5 filament or hum modulation will appear on  $V_{1B}$ .

The low-pass filter,  $L_1C_4C_6$ , causes the output to begin dropping off at about 2000 cycles and it is down approximately 10 db. at 5000 cycles. The constants of the speech amplifier are such that the response decreases below 500 cycles and is down about 13 db. at 100 cycles.

$S_1$  is used to switch the compressor in and out of the circuit as needed. The placement of parts is not critical so long as the input wiring is separated from the power supply and any inductive hum pick-up. Shielded wire was used on the input and output leads.

To set up the compressor for normal operation an oscilloscope is a great help in showing how effectively the circuit is working and how much compression can be used before the amplifier following it overloads or distorts. Remember there is a limit to how much you can compress speech and still recognize it!

In conclusion I would like to acknowledge the aid of Ed Walker, W5KFW, without whose help the "Electronic Funnel" could not have been completed.

### "Tubeless VFO"

(Continued from page 32)

and to anything that goes on in the exciter. A very sensitive, and simple, test can be used to check small frequency changes if a fairly pure audio source is available for the conventional two-tone test. Set up the exciter for a.m., balance out the carrier, and apply the audio signal. Tune in the r.f. signal on the receiver with the b.f.o. and a.v.c. off, and set the tuning midway between the two sidebands. If the audio tone is, for example, 1000 cycles, a 2000-cycle beat will be heard. Then use the b.f.o. to replace the carrier, and as the exact frequency is approached the tone will approach 1000 cycles, modulated in intensity by the frequency error of the b.f.o. setting. If the b.f.o. is placed within a cycle or so of zero beat, changes in the VFO frequency as various controls on the exciter are varied will show up as a change in the rate of intensity variation. This test will be accurate for quick checks but is not too reliable for measuring such things as drift since it requires that both the receiver h.f. oscillator and b.f.o. be absolutely stable over the entire checking interval. For checking over a period of time an additional reference is needed; a crystal used with the exciter in the normal way will serve well enough, the VFO being adjusted to exactly the same frequency as the crystal at the start of the test.

— G. G.



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## Protective Circuit

(Continued from page 33)

conventional clamp-tube arrangement:

1) The screen voltage may be adjusted without affecting the bias by varying  $R_2$ , thus providing a convenient power input control for testing, tuning up, local QSOs or holding the power under the figure specified for certain multipliers in contest operating.

2) The twin triode does double duty, replacing the high-wattage screen resistor and the protective tube.

3) It is possible to reduce the screen voltage to very low values during excitation failure by making  $R_1$  and  $R_2$  high resistances. With the conventional circuit the only way to lower the screen voltage is to reduce the resistance of the clamp tube.

This circuit may be adapted for other screen voltages by changing the ratio of  $R_1$  to  $R_2$ . For tubes requiring higher screen voltages, the 6AS7G or 6BL7GT would appear to be logical choices in place of the 12AU7.<sup>1</sup> Although it has not been attempted, there seems to be no reason why this circuit could not be used in a plate-modulated amplifier by inserting an audio choke in the screen lead to the amplifier.

The 6146 could be screen modulated by adjusting  $R_2$  to reduce the screen voltage to half the c.w. value, and then applying the modulating voltage to the grid of the cathode follower through a 0.01- $\mu$ f. condenser. Since the output impedance of the cathode follower is low, the voltage at the screen of the amplifier will follow the input audio voltage faithfully, and thus should result in somewhat more linear modulation than is possible with ordinary clamp-tube modulation.

<sup>1</sup> If the circuit of Fig. 2 is used exactly as shown, some attention must be paid to the peak heater-cathode voltage rating of the tube used as d.c. amplifier and cathode follower, since it establishes a limit to the screen voltage of the r.f. amplifier. For example, the 12AU7 is rated at 180 volts, the 6BL7GT at 200 volts, and the 6AS7G at 300 volts, peak heater-cathode voltage. If the heater-cathode voltage rating would be exceeded, the d.c. amplifier and cathode-follower functions can be assigned to separate tubes, and the cathode-follower heater supplied by a separate transformer winding, one side of which is also connected to the cathode. — Ed.

## Strays

Likely to be of interest to amateurs is a new type of wire mentioned by W9TO in the *Podunk News*, organ of the Egyptian Radio Club (Ill.-Mo.):

"Formed by reverse drawing extremely fine wire, this conductor has the velocity factor of .07. Thus a 40-meter half wave is 4.62 feet long and a ten-meter mobile whip shrinks to a mere 6.7 inches. One experimental antenna being pruned for operation on 147.3 Mc. disappeared altogether."

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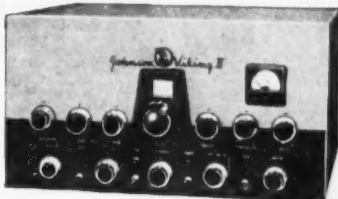


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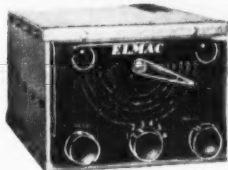
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**Using Frequency Standards**

(Continued from page 56)

coincide with the frequency we're supposed to be listening to, not the actual frequency of the receiver oscillator. In this case it might read 3800 kc. at a capacity value of 20  $\mu\text{f.}$  Thus, in order for us to actually hear a 3800-kc. signal at this setting, the bandset condenser,  $C_{\text{set}}$ , would have to be set to give a capacity of 80  $\mu\text{f.}$ , since we need that total capacity of 100  $\mu\text{f.}$  to be on 4300 kc. with the high-frequency oscillator.

Now let's be really nasty sometime when you aren't looking, and loosen the setscrew on your bandspread condenser and move the scale around a bit. It might end up so that 3800 kc. on the scale coincides with a capacity of 18  $\mu\text{f.}$  instead of the original 20. If you left the bandset condenser as it was before, corresponding to a capacity of 80  $\mu\text{f.}$ , you would no longer be tuned to 4300 kc. For a bandspread-dial setting of 3800 kc. you would actually be listening to a slightly higher frequency, since the high-frequency oscillator circuit now has a total  $C$  of  $80 + 18 = 98 \mu\text{f.}$  instead of the required 100.

What to do about it? You could dig into the set and fix the scale on the shaft the way it was before we sabotaged it for you, but there is a much easier way. Just move the bandset condenser a little, so that it corresponds to a capacity of 82  $\mu\text{f.}$ , and now your total  $C$  is back to 100  $\mu\text{f.}$  and the bandspread scale reads correctly.

All this long rigmarole is for only one purpose: To fix in your mind that the bandspread dial can be made to read absolutely correct at *at least one point* by proper setting of the bandset condenser. And you really don't care what the bandset condenser scale says — you're only interested in reading the bandspread dial.

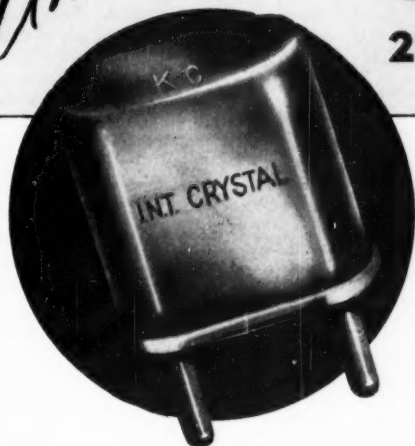
Actually, we have no intention of sneaking into every ham shack and changing the bandspread scales on receivers. We don't have to. We can leave that job to manufacturing tolerances, temperature and humidity, and aging. But why worry about it? You can always set the scale on the nose at at least one point by a change in the bandset condenser. If you have a 100-kc. frequency standard, you will always have 100-kc. check points for the job. The logical procedure, of course, is to set up the bandspread dial so that it reads "on the nose" on the band edge closest to where you are operating at the time.

But suppose that you set up the receiver so that it indicates 3500 kc. "on the nose" and you find that 3600 and 3700 kc. don't come out exactly right? You can worry if you want, or you can bend the condenser plates as outlined earlier. But the simplest procedure is to note whether these points are reading "high" or "low" and how many kc., and file the information for future reference. What you have actually done is to recalibrate the receiver — you now know that when you're "on the nose" at 3500 kc., the receiver reads so many kc. high (or low) at 3600 and 3700 kc. By following the same procedure from all band edges, you are all set.

(Continued on page 126)

# Amateurs and Experimenters!

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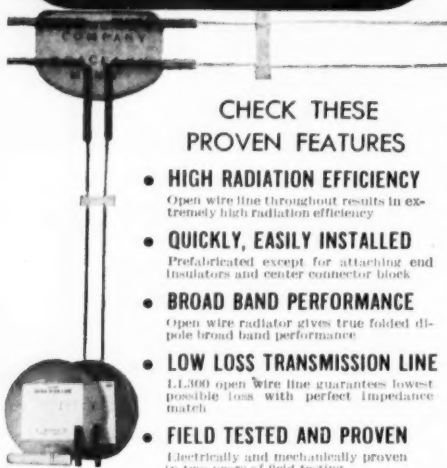
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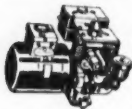
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One last point. When you get to 21 and 28 Mc., you may have trouble determining whether a signal from the 100-ke. standard is 28,000 Mc., or 28,100 Mc., for example. There's a simple way out. With a crystal or VFO signal in the low-frequency end of the 80-meter band, you can use its 8th harmonic to cross-check. Say you have a crystal at 3600 kc., or you have a VFO that can be set there. (The VFO can be set "on the nose" by cross-checking against the 3600-ke. from your 100-ke. standard.) Now set the bandspread dial at 28,800 Mc. ( $8 \times 3600 = 28,800$ ) and tune with the handset dial until you hear the crystal or VFO harmonic. You now know that you're close to right, so turn on the 100-ke. standard and listen for its harmonic around 28,800 Mc. and then work back up the band. In other words, the 100-ke. standard harmonic closest to the VFO harmonic will be 28,800 Mc. The next lower one will be 28,700 Mc. and so on. If, when you get to 28,000 Mc. the bandspread dial reads a little off, you know what to do. Working the two dials together, so that you won't jump from the 28,000-Mc. harmonic to the next higher or lower one, keep the signal in tune as you set the bandspread dial closer to 28,000 Mc. and compensate with the handset dial. Then log the setting of the handset dial for future reference, so that you can come close to the right setting before you put it "on the nose" with the signal from your 100-ke. standard.

If you have a 100-ke. standard and a 1000-ke. standard, you can pick up most band edges easily (at the low-frequency ends) with the harmonics from the 1000-ke. standard, but the method just outlined is simply a "poor-man's version" of the same general procedure.

When you have familiarized yourself with the above procedure, you should have a better understanding of frequency standards and two-dial receivers. You will appreciate that a bandspread dial calibration *may* be correct over an entire band but it is more likely not to, unless you want to pay a lot more for the receiver. You should also recognize that you can *always* bring at least one point on the scale into exact calibration by a proper setting of the handset condenser.

And finally, to get back to the W2JN frequency standard, you may want to convert your present 100-ke. standard to this newer circuit, to give you check points every 50 kc. and thus be able to mark band edges and subband edges that you can't hit with the straight 100-ke. standard. You use it the same way that you use the 100-ke. signals, of course.

— B. G.

## Strays

Observing his ham grandfather employing a casting rod to loop an antenna draw-line over a large tree, W9CMT's grandson ran to his mother and said: "Grandpa's gone loco, mama. He's out fishing in a tree."

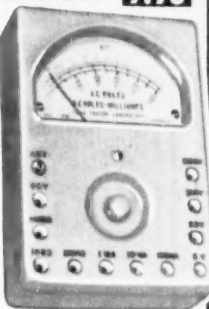
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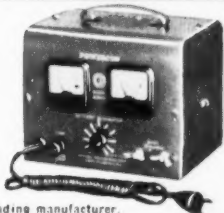
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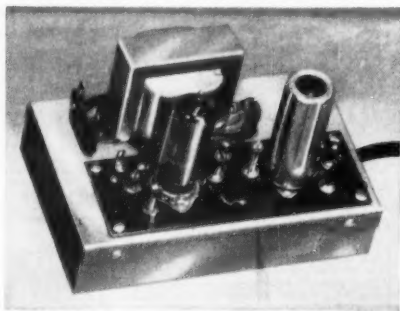
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Additional Details in *CQ Magazine*: Page 32, Dec., 1953



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## Tech Topics

(Continued from page 86)

propose that shading be used to distinguish the two forms of conduction. If the "n" areas are darkened this would be in accordance with the practice of assigning the color black to negative terminal connections.

Although the physical principles of transistor operation are different from those of a vacuum tube, the circuitry principles are very similar. The following will serve as a tool to help the reader understand transistor circuitry.

Referring again to Fig. 3, let us determine the correct polarity of the voltages to be applied to the various elements of a junction transistor. In an *n-p-n* transistor the emitter (cathode) is *n*-type and therefore has an excess of electrons that can be released. Once released, the electrons travel through the base (grid) region and are attracted to the collector (plate) when the collector is made positive with respect to the emitter. This is analogous to the operation of a vacuum-type triode — only the biasing conditions are different. For most circuit applications the base of an *n-p-n* transistor is positively biased, while the grid of a vacuum tube is usually negatively biased. For *p-n-p* transistors, following the same line of reasoning, it can be seen that the polarities would be exactly opposite to those used for the *n-p-n* type, since holes rather than electrons are released by the emitter.

The new symbol proposed by the authors for the junction transistor should be of great assistance both to those who wish to build published transistor circuits and those who wish to design their own circuits. The similarity of this type of transistor with the vacuum tube, stressed by the new symbol, makes this possible. Vacuum-tube circuit design often can be applied to junction-transistor circuitry with little modification. Further, the proposed symbol avoids the ambiguity that arises when one symbol is made to serve two meanings.

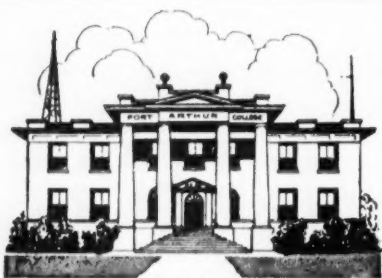
— Donald Klein, W1GKR, and  
William Slusher, W1ZYX

## Switch To Safety

(Continued from page 72)

because they assure an open circuit regardless of line polarization.) A heavy double-pole switch that will entirely disconnect *all* shack gear from the a.c. line is highly recommended. (3) Take great care that no a.c. or d.c. voltages appear on the antenna installation. It is important to note that the a.c.-charged W5AIZ antenna was not only a threat to the operator but was a menace to whoever might have encountered it.

The sympathies of all amateurs go out to the Watson and Seiders families. Let us individually appraise our stations and safety-precaution techniques — *it is always time to do so*. Amateur radio, one of the most respected of all hobbies, must not gain reputation as a dangerous one.



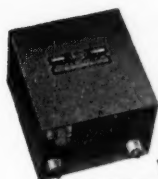
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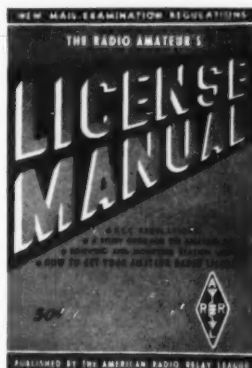
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## QST—Volume I

(Continued from page 45)

certain prediction, ascribed to some unidentified *Radio Inspector*, is quite startling. In an editorial on page 173 of the July (1916) issue, we find these passages:

... We asked this Inspector where he thought the amateur equipment would be five years hence. He said he had not the least doubt that every good amateur would be transmitting by means of undamped oscillations. ... This nearly caused us to reel off our chair when we first heard it, but a little thought made it look quite reasonable. ... Some amateur is to be the forerunner of a lot of undamped wave work, and we are waiting for it. Nothing will help us perfect a country-wide relay system so quickly. ...

... If it turns out that transmitting apparatus can be developed for transmitting undamped waves, and which will be of moderate price, it might be that there would be something in this idea of creating a higher class certificate for undamped wave stations. ...<sup>23</sup>

I would like to know who that particular *Radio Inspector* was. Perhaps he was H. C. Gawler of the First District.

In Volume I many spark stations are described; but the one which strikes me as having the most interesting design of all is that of R. A. Miller (6RJ, Lone, California). He used a 200-cycle generator, with a synchronous rotary spark-gap mounted on the end of the generator's shaft. His transmitting condenser is described as being of the "air space" type — meaning (I believe) that air was used as the dielectric. Using a half-kilo-watt power transformer, he had "no difficulty" working station 7ZII, La Grande, Oregon, 550 miles away; and he was heard by 7CM (Lacy, Washington).<sup>24</sup>

The antenna systems at amateur or experimental stations, in 1915-1916, sometimes reached very respectable heights. In Volume I two towers over 100 feet high are mentioned; and one must higher than 100 feet is referred to.<sup>25</sup>

An arrangement which was announced on page 157 of the July (1916) issue of *QST* resulted in the publication of some well-written technical articles. Under it, all papers presented before The Radio Club of America were to be printed in the magazine. The first one to appear following this

(Continued on page 132)

<sup>23</sup> A letter from Wallace A. Heckman (1AA), at 56 to 57, March 1921 — Volume III, of *QST* — states that in Argentina "radio telephony and continuous wave transmitters have been the rule, rather than the exception, this being the case even in the years before the Great War. ..."

<sup>24</sup> 360, November 1916. Note that the old Essenden (N.E.S. Co.) 100-kw. spark transmitter at NAA used a transmitting condenser in which compressed air formed the dielectric. See Volume IV, No. 5, of the *Proceedings of the I.R.E.* (October 1916), page 427. A photo of the compressed-air condenser appears on page 428. The air was compressed to a pressure of 250 pounds per square inch.

<sup>25</sup> O. M. Hencock, of La Grande, Oregon, had a tower 110 feet high. A pole extended upward from it, reaching 140 feet. See 86, April 1916. Pennsylvania State College's experimental station, 8XE, had a steel tower 210 feet high. (Most of this station's transmissions were on 500 meters.) See 85 to 86, April 1916. M. B. West (8AEZ) had a mast rising 110 feet into the air. See 263, September 1916.

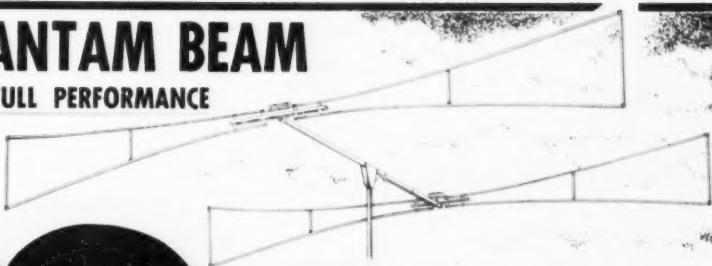
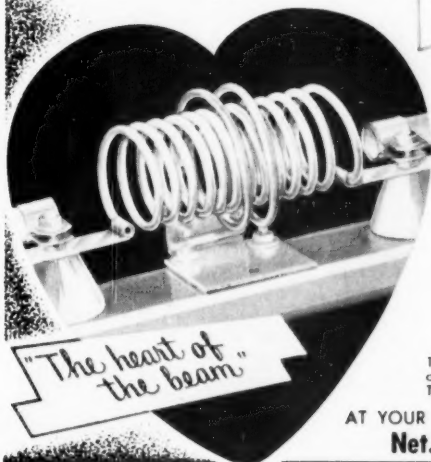




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THE HALF-SIZE, FULL PERFORMANCE

20 METER  
ARRAY



The superiority of the Gonset "Bantam 20" daily becomes more obvious as hundreds of users add new countries to their DX totals. There are excellent reasons for this outstanding Bantam Beam performance—Bow-tie element structure for broad banding . . . for added end capacity to ensure least possible number of coil turns and . . . "The heart of the beam," ample size, very high Q copper tubing coils—silver plated, self-supporting (Air wound). Steatite element and coil end supports.

These and other significant Gonset design features greatly minimize losses, give performance in all kinds of weather approaching that of a full-length 20 meter array.

16 1/2' tip-to-tip . . . very low SWR . . . symmetrical pattern with 52 ohm coax . . . good F-B ratio . . . rotated readily by any good TV rotator.

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Net...\$9.50

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YOU'LL SAVE DOLLARS and TIME

— DO A NEATER JOB — with a

**KNURL-TITE** ADJUSTABLE DRIVER FOR FINISH NUTS



Needed in Every Tool Kit

A PRODUCTION TOOL — and for Repair Men and Handy Men

Here's the **right tool** for tightening and loosening knurled finish nuts. Specially designed for electrical products using toggle chain, push button fixtures, etc. Finish nuts slip "flush" into the jaw, and when KNURL-TITE is used, the fine surfaces of panels are not scratched, marred or damaged. With the small average thickness of knurled finish nuts, it is difficult, or almost impossible, to positively "set" a knurled nut with any other wrench because "no other wrench holds like a KNURL-TITE."

KNURL-TITE (Pat. Pend.) is simple to use. When a knurled nut is slipped into the collet-type pressure jaws, a quick, quarter handle-turn locks it tightly. It is a light, compact, sturdy Tool Kit Tool with a shock-proof, high impact resisting handle and non-rusting nickel plated body section. The hollow collet barrel accommodates the long shanks of toggle switches.

4 CONVENIENT SIZES:

KR-37	3/8" diameter nut	\$5.25
KR-50	1/2" diameter nut	\$5.25
KR-62	5/8" diameter nut	\$5.50
KR-75	3/4" diameter nut	\$5.50

Each KNURL-TITE has up to 1/6" adjustment to take nuts slightly larger or smaller.

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5" x 8" x 7" deep

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New exclusive meter, D'Arsonval movement, new crystal oscillator circuit using 6CL6 tube. VFO-XTL crystal switch and VFO connector now on panel. Same professional performance and fine quality as found in Babcock military radio equipment. Constant solid signal, every tube, every part tied down. Lifetime gray Hammertone metal case, easy to install. Examine—compare—buy Babcock!

Price complete with tubes, plugs and instruction book, Ham net..... **\$119.50**

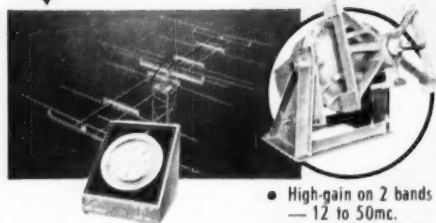
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# TRYLON



## heavy-duty rotary beam system

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are made only by,

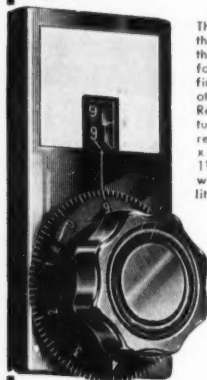
- High-gain on 2 bands — 12 to 50mc.
- Choice of 3 or 4 element, 1 or 2 band arrays
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- Selsyn-controlled indicator and remote control box
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## TURN COUNT DIAL

Our users say, "This is what we wanted"



This dial can be used on any device that requires the recording of more than one full turn. Users report it ideal for roller inductances, INDUCTUNERS, fine tuning gear reducers, vacuum and other multi-turn variable condensers. Registers fractions to 99.9 turns. Full turn count stationary until next turn registers. Case: 2" x 4". Shaft: 1/4" x 3". Model TC2 has 2 1/4" dial with 1 1/4" knob. Model TC3 has 3" dial with 2 1/4" knob. Black molded bakelite.

- Mounts on front of panel with one hole.
- Large easy grip knobs.
- Handy logging space.

TC2 \$3.90

TC3 \$4.20

**NOW AVAILABLE  
SPINNER HANDLE FOR TC MODELS  
ONLY 75c**

All late TC models have hole spotted. Spinner can be mounted on any knob where small hole can be drilled.

Parcel Post Orders: Add 8¢ for dial, 3¢ for spinner.

**R. W. GROTH MFG. CO.**  
10009 Franklin Ave. Franklin Pk., Ill.



announcement was Paul F. Godley's "Applications of the Audion."<sup>26</sup>

H. R. Hick's first cover design for *QST* adorns the May (1916) issue; and from May to November (1916) this artist's work was used on the front covers. Of course, his contributions were to continue for a long time thereafter, as succeeding Volumes will show.

The "Who's Who in Amateur Wireless" department first appeared in the August (1916) number, at page 215. The first two "hams" to be "written-up" were Dean A. Lewis (1ZL) and C. D. Tuska (1ZT). The second pair, featured at pages 262 to 263 in the September (1916) issue, were Lindley Winsor (6ZW) and M. B. West (8AEZ). Roy C. Burr (8ZI) and Emma Candler (8VH) were selected for the October, 1916, issue. See pages 303 to 304. Next came the Seefred brothers (6EA), at page 351, November 1917.<sup>27</sup>

The first Book Reviews which I have found in *QST* appear on page 8 of the first issue (December 1915). No others were published until the appearance of the July (1919) number. It was part of Volume II.<sup>28</sup>

In Volume I, very little non-amateur news appears; but at 336 to 337, November 1916, Federal District Judge Julius M. Mayer's decision holding De Forest's audion to be an infringement of Dr. John Ambrose Fleming's patent on the 2-element "Fleming Valve" (invented in 1905) is noted. (De Forest said he would appeal.)

And at 234, August 1916, the first public demonstration of the "Marconi Wireless Telephone"<sup>29</sup> is reported. It is interesting to note that the transmitting station was on land and the receiving station aboard ship. The vessel answered via "dot-and-dash." This item reads as follows:

The first public demonstration of the Marconi Wireless Telephone took place Monday evening, June 12th, when the experimental station at Aldine, N. J. talked to David Sarnoff on the steamship *Bunkerhill* which was taking the members of the New York Technology Club to Boston to attend the dedication of the new buildings of the Massachusetts Institute of Technology.

Conversation was begun at eight o'clock and lasted until ten when the steamer was sixty miles up  
(Cont.ued on page 134)

<sup>26</sup> 193 to 200, August 1916; 239 to 244, September 1916. A. H. Grebe described his experimental station, in the second paper published. See 288 to 292, October 1916. *Before* the July, 1916, announcement, two articles which had been presented before The Radio Club of America had been published in *QST*: "Wireless and The Aeroplane," by L. J. Lesh, 122 to 125, June 1916; and "Distributive Capacity and Dead End Effect," by Harry Sadenwater, 158 to 160, July 1916.

<sup>27</sup> *Before* the Department was instituted, photographs of several prominent Amateurs had appeared in *QST*. For example: photo of Maxim, at 19, February 1916; photo of A. A. Hebert (2ZIH), at 96, May 1916; and photo of R. H. G. Mathews (9IK), at 97, May 1916.

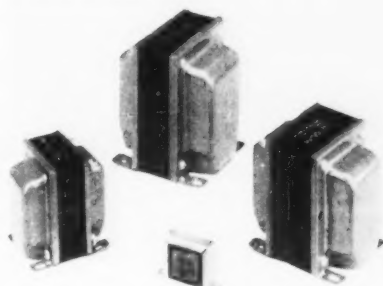
<sup>28</sup> 15, July 1919. In Volume III of *QST*, the Book Reviews were also scarce. See 45, March 1920; 44, May 1920; 43, June 1920; and 43, July 1920.

<sup>29</sup> I have found no mention of experimental broadcasts via De Forest's radiophone in *QST*, until Volume II. See 26, January 1917 ("A Concert by Wireless"); and 72 to 74, April 1917 ("De Forest Wireless Telephone").

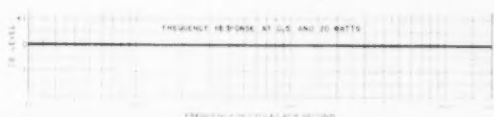
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This Freed circuit incorporated several changes from the original Williamson circuit to provide optimum performance at high and low frequency extremes. It is rated at 10 watts with triode connected output tubes. However, by connecting the screen grids of these tubes to taps provided on the Freed KA-10 output transformer, it is possible to double the power output for a given distortion percentage. Recommended power supply is choke-input type with a two-section L-C filter to maintain constant D.C. output and to improve filtering to the voltage amplifiers.

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FREED KC-11 FILTER REACTOR



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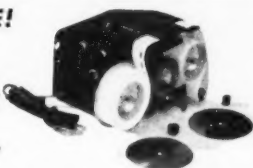
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RECEIVING  
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Automatic Sender

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HARRISON'S ANNUAL  
PRE-INVENTORY

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- Store-wide price slashes!
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Come early (Cash and Carry) Come often  
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225 GREENWICH STREET • NEW YORK

## YOUR HQ FOR HY-LITE BEAMS

- 2 MR-Q ..... \$18.90
- 2 MQ-P ..... \$7.95  
SINGLE QUADRAPOLE
- 4 E 2 ..... \$8.75  
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- 2 E 20T ..... \$47.95  
2 EL. 20 MTR/T-MATCH
- 6 E 10-20T ..... \$98.95  
3 EL. 10 MTR/3 EL. 20 MTR  
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### LETTINE MODEL 240 TRANSMITTER WITH MOBILE CONNECTIONS AND A.C. POWER SUPPLY

This outstanding transmitter has been acclaimed a great performer throughout the world. Excellent for fixed station, portable or mobile operation. Air wound plug-in coils used for greater efficiency — never obsolete — will take any new freq. Ideal for General Class Amateur, Novice, C.A.P., C.L., M.A.R.S., Broadcast, Marine and Airport Communications. An outstanding buy, direct from our factory, ready to operate.

The 240 is a 40 to 50 watt Phone-CW rig for any freq. from 1.6 to 30 mc., complete with: (8 x 14 x 8) cabinet, A.C. power supply, 40 meter coils and crystal and tubes: 6V6 osc., 807 final, 5U4C rect., 6XJ7 crystal mike amp., 6N7 phase inverter, 2 6L6's PP mod. for excellent audio quality. Weight 30 pounds. TVI instructions included. 90 day guarantee. Price \$79.95.

\$25 deposit with order — balance C.O.D.  
80, 20, 10 meter coils \$2.91 per Band, 160 meter coils \$3.60.

MODEL 130 FOR 120 TO 130 WATTS  
MODEL 242 FOR 2 METERS — 45 WATTS INPUT  
LETLINE VFO AND ANTENNA TUNER

**LETTINE RADIO MFG. CO.**

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... more widely used  
for military applications

... more widely used  
by the world's  
leading airlines

... more widely used  
for critical communications  
of every type.



**STANDARD PIEZO COMPANY**  
Carlisle, Pa.



... by the pioneers of  
modern crystal developments

Long Island Sound. The *Bunkerhill* was not equipped with a wireless telephone so the results of the demonstration were announced by radio telegraphy. The clearness of the signals amazed the listeners on board the *Bunkerhill* and among those who heard the test were Mr. Sarnoff, Orville Wright, A. R. Hawley, Rear Admiral Capps and Alexander Graham Bell. After the conversation had been carried on for a time, Mr. Weagant played a phonograph and the strains of "The Star Spangled Banner" greeted the listeners. Then came the "Marseillaise" and in response to an encore, Mr. Weagant played "Tipperary." The test was a complete success.

As of June (1916), the "hams" were still blissfully unaware of the fact that in the autumn of 1921 amateur spark, 'phone, c.w. and i.e.w. signals would be arousing the wrath of thousands of broadcast listeners equipped with nonselective receivers. And I doubt if any of the famous personages aboard the *Bunkerhill* that night could have predicted it, either.<sup>30</sup>

The October, 1916, issue of *QST* contains two items which appear to me to be of unusual interest: (1) an advertisement of A. H. Grebe & Co. describing its "new type AGP 101 Short Wave Regenerative Receiver," which states that this instrument will tune down as low as 150 meters,<sup>31</sup> and (2) a letter from Cedric E. Hart (6SL, Salt Lake City, Utah) which speaks of the visit of the "Navy Safety Train" to his city.<sup>32</sup> This train was equipped with a half-kilowatt quenched-gap spark transmitter, operating on 600 meters. Station 6SL took a message from the train and delivered it to Lieutenant Edwin Guthrie of the local Navy recruiting station. *The call used by the train was NSF* — a call to become world-famous after World War One, when the Naval Radio Laboratory at Anacostia began experimenting with "tube" transmitters on wavelengths around 250 meters.<sup>33</sup>

On its merits as a magazine, alone, I consider the first volume of *QST* to be a remarkably good performance, considering the financial stringencies encountered and the lack of full-time editors and employees. However, there was plenty of room for improvement; and Maxim, Tuska, et al., probably realized this at the time.

Whatever its shortcomings, Volume I of *QST* is rich in sentimental values. If proof be needed, just try to purchase those twelve little issues of the magazine from some "old-timer" who has saved (or has collected) them!

— S. B. Y., WOCO

R. R. 3, Box 94  
Wayzata, Minnesota  
December 30, 1953

<sup>30</sup> In 1922, De Forest estimated the listening public at over one million; and he shrewdly predicted five million "BC's" in two years, and twenty million by 1927. See Volume V of *QST*, at 54, July 1922.

<sup>31</sup> 328, October 1916. See, also, inside front cover of the September, 1916, issue, for the first appearance of this ad.

<sup>32</sup> 305, October 1916.

<sup>33</sup> See 8, November 1920 (station described by Kruse); 52, November 1920 (heard in England; letter of W. R. Wade); 48, January 1921 (repents, on 250 meters, the long-wave signals received from MUC, POZ, and YN); 32, April 1922 (called "the first powerful short-wave c.w. station"). In 1925, the Laboratory was using the call NKF when communicating with NRRL. See 31 to 32, July 1925; 10 to 12, 14, January 1926.

# The New -- 20 METER SHORTBEAM PRE-TUNED! ... 3 ELEMENT ROTARY BEAM

Amateur Net \$59.95

It's pre-assembled

Pre-assembled at the factory. All complete — Coils, elements, cross arm, stand-offs and "U" bolts are assembled as one unit. Attach the three elements to boom and you are ready! You get "top-man-on-the-frequency" results even in a limited area installation.

- Element lengths, 16 feet (approximate)
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- Approx. weight 20 lbs.
- Turns with a T.V. Rotator
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- 6051 aluminum used for elements, boom, cross arms and mast
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Also Available

the "R.S. short dublet" for 40 and 75 meters

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You can enter this uncrowded, interesting field. Defense expansion, new developments demand trained specialists. Study all phases radio & electronics theory and practice: TV, FM, broadcasting, servicing; aviation, marine, police radio. 18 month course. Graduates in demand by major companies. H.S. or equivalent required. Begin Jan., March, June, Sept. Campus life. Write for Catalog.

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**R** The Collins 75A-3  
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Dr. Qwak (Willard Wilson — W3DQ) also has B & W, Collins Xmtrs, National, Hallcrafters, Johnson, Elmac, Gonset, etc. . . . all for prompt delivery, and on the easiest of terms. Write today.

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Member OOTC — VWOA — QCWA  
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For That Extra Margin  
of Safety . . .

**Copper Plated  
Ground Rods**

Bring Extra Profits

**Simple!** Practical! Low-priced! Of smooth-drawn steel, pointed for easy driving and copper-plated for rust prevention and to assure clean electrical contact. Available in four popular styles, in 4', 6' and 8' lengths,  $\frac{3}{8}$ ",  $\frac{1}{2}$ " and  $\frac{5}{8}$ " diameters. Send for special Ground Rod Bulletin and prices.



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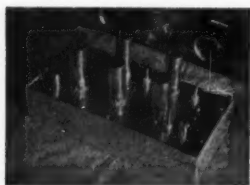
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## CASCADE CRYSTAL CONTROLLED CONVERTER for 144 or 220 Mc.



### Provides:

- HIGH SENSITIVITY — Sensitivity better than 1/10 microvolt. Gain approx. 30 db. Noise approx. 4 db.
- COMPLETELY STABLE, C.W. on 144 mc. NO mechanical modulation. Pure D.C. note. No drift.
- RUGGEDLY BUILT — Suitable for mobile application.
- USE WITH ANY COMMUNICATIONS RECEIVER — Availability with output at I.F. frequencies 6-10 mc., 8-12 mc., 10-14 mc., 12-16 mc., 14-18 mc. We recommend use at I.F. output 14-18 mc.
- COMPLETELY SHIELDED — In beautifully finished silver gray hammett-tone steel case.
- Available (SPECIAL ORDER) for other CD or industrial frequencies. Also available for Collins receiver.
- USES 6BZ7, 2 — 6CB6, 2 — 6J6 tubes. COMPLETE with plugs, tubes and crystal. **\$42.50**
- Kit Form. Complete. **\$29.75**

Ask your dealer or write us

**THE EQUIPMENT CRAFTERS, INC.**

523 Winne Ave.

River Edge P.O., N. J.

## World Above 50 Mc.

(Continued from page 64)

2200 Aug. 2nd, but from then through the following morning he was busy with W2s and 3s, most of whom were making their first Maine contacts on 2. Over 40 stations were worked, with W3IBH, Philadelphia, the best DX.

And here's a journey that should provide some interesting 2-meter contacts, W6MJ is making the river trip from Cincinnati to New Orleans, October 23rd to 30th. He will have his Communicator aboard the *Della Queen*, and will operate nightly, checking on the hour.

There's plenty of other operating news this month. In fact, the correspondence on hand is so great that we cannot really do justice to it in the space and time available. Material for this month's column, and for the issue to follow, is being prepared in the last days before our departure on a swing around the western part of the country. This will occupy most of September and October, and will permit the writer to meet v.h.f. men in many areas of the West where we've not had the opportunity of visiting heretofore.

Operating news will, therefore, be rather low in this department for a while. We are substituting some hints-and-kinks style material in the next issue that we hope you'll find useful, and we'll try to pick up the latest news along the way to send back to West Hartford. We'll be visiting at least 15 states west of the Mississippi, meanwhile; hoping to return with a far better appreciation of the problems and accomplishments of the v.h.f. fraternity in W5, 6, 7, and 8 than we've been able to pick up by remote control since the fall of 1939, when WH1DQ appeared in the by-line of the first regular v.h.f. coverage in QST.

## New U.H.F. Twin Tetrode

A new transmitting tetrode recently announced by RCA will be of particular interest to 220- and 420-Mc. enthusiasts. Numbered the 6524, it is capable of up to 45 watts input at 450 Mc., in c.w. or f.m. service. Up to 100 Mc. it takes 85 watts input. It is thus in between the popular 832A and 829B in power-handling capabilities at 144 and 220 Mc., and it far exceeds either type at 420 Mc. Best of all, the price is somewhat lower than these v.h.f. stand-bys, if we're talking about now-tube prices rather than surplus.

The 6524 is designed for efficient operation at 300 volts, though up to 600 can be used below 100 Mc. In plate-modulated service, 500 volts is the rated maximum, and up to 40 watts output can be obtained under ICAS conditions. For 420-Mc. work a plate supply of 300 volts is recommended for all classes of service.

We've put two of the tubes to work in a 432-Mc. tripler-amplifier soon to be described in QST and the *Handbook*. The tripler stage is driven easily with a 2E26 amplifier on 144 Mc., and it, in turn, provides adequate drive for the 432-Mc. amplifier. Running 30 watts input, useful output of about 12 watts is developed on 432 Mc. An interesting feature of our layout is that it operates stably on 432 Mc. without neutralization or screen by-passing. The tripler delivers 7 watts on 432 mc., with an input of about 25.

One word of caution in using the 6524: It uses the same type of socket as the other dual tetrodes, but the base connections are different. You can't slip it into the last two stages of your 522 or ARC-5 and go merrily on. It takes a little rewiring first, but the results appear to be well worth the effort.

## Strays

ARRL Director W8SPF causes us to wonder if 14-year-old W8IRO may not be the youngest holder of an Extra Class ham ticket.

## FEED-BACK

In the Hint & Kink on low-voltage regulation, page 42, August 1954 QST, voltages  $E_1$  and  $E_2$  should have been defined as the rated voltage drops across voltage regulator tubes  $VR_1$  and  $VR_2$ , respectively, rather than across  $R_1$  and  $R_2$ .

## QUARTZ CRYSTALS

### GUARANTEED

Low Frequency — FT-241A for SSR, Lattice Filter etc., .093" Pin, .486" SPC, marked in Channel Nos. 0 to 79, 54th Harmonic and 270 to 309, 72nd Harmonic. Listed below by Fundamental Frequencies, fractions omitted.

49¢ each — 10 for \$4.00

370	393	414	436	498	520	400	459
372	394	415	437	501	522	440	461
374	395	416	438	502	523	441	462
375	396	418	441	503	525	442	463
376	397	419	442	504	526	444	464
377	398	420	444	505	527	445	465
379	401	422	445	506	529	446	466
380	402	423	448	507	530	447	468
381	403	424	447	508	531	448	469
383	404	425	448	509	533	450	470
384	405	426	449	511	534	451	472
385	406	427	491	512	536	452	473
386	407	429	492	513	537	453	474
387	408	430	493	514	538	454	475
388	409	431	494	515		455	476
390	411	433	495	516		456	477
391	412	434	496	518		457	479
392	413	435	497	519		458	480

99¢ each — 10 for only \$8.00

CR-1A		FT-171B — BC-610				
SCR 522- $\frac{3}{4}$		Banana Plug, $\frac{1}{4}$ " SPC				
Pin, $\frac{1}{2}$ " SP						
5910	7350	2030	2260	2390	3155	3550
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6470	7400	2082	2300	2442	3237	3645
6497	7580	2105	2365	2532	3250	3955
6522	7810	2125	2370	2545	3322	3995
6547	7930	2145	2380	2557	3510	
6610		2155			3520	
		2220				
		2258				

Special — 200 KC or 500 KC in FT241A Holder — only \$1.75 each

Add 20¢ postage for every 10 crystals (or less).

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PARTS DISTRIBUTORS, LTD.

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FT-243 — .093" Pin Dia. — .486" Pin SPC for Ham and General Use

49¢ each — 10 for \$4.00

4035	5437	5950	6800	7610	7900
4040	5485	5973	6806	7625	7904
4165	5580	6240	6825	7640	7925
4190	5660	6250	6850	7641	7940
4260	5675	6273	6875	7650	7950
4300	5700	6275	6900	7673	7973
4330	5706	6300	6925	7675	7975
4307	5725	6325	6950	7700	8204
4490	5840	6350	6975	7706	8225
4495	5750	6373	7450	7720	8260
4535	5773	6375	7473	7725	8273
4735	5780	6400	7475	7740	8275
4840	5806	6406	7500	7750	8300
4930	5840	6425	7506	7773	8325
4950	5852	6473	7525	7775	8630
4980	5873	6475	7540	7800	8683
5030	5875	6700	7750	7825	8690
5205	5880	6706	7753	7840	
5300	5906	6725	7755	7850	
5385	5925	6750	7800	7873	
5370	5940	6775	7806	7875	

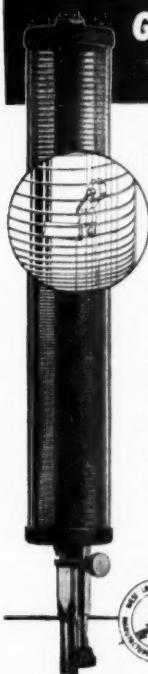
99¢ each — 10 for \$8.00

1015	6100	6600	7200	8075	8500
2125	6125	6606	7250	8100	8525
2500	6140	6625	7300	8125	8550
3640	6150	6640	7306	8140	8575
3680	6175	6650	7325	8150	8600
3735	6200	7000	7340	8173	8625
3760	6400	7025	7350	8175	8650
3900	6450	7050	7375	8200	8700
3985	6473	7073	7400	8340	8733
3940	6475	7075	7425	8350	
3990	6500	7100	7440	8380	
6000	6506	7125	8000	8400	
6025	6550	7140	8025	8425	
6050	6573	7150	8050	8450	
6075	6575	7175	8073	8475	

SPECIAL — 200 KC without Holder 59¢ each — 3 for \$1.50

**BC-746 TUNING UNITS**  
Channels 10 and 12  
Foundation coils and condenser  
for 80 meter VFO or oscillator — **98¢**  
See Article by W8PQ in March, '54 CQ

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### NEW! . . . SILVER-PLATED ROLLER WITH POSITIVE ACTION, STAY-PUT CONTACT

#### No. "666" MASTER **ALL-BANDER** For 10-11-15-20-40-75 Meters

A great advancement in antenna coils . . . fully enclosed, the non-linear, "variable-spaced" adjustable silver-plated roller with built-in Hy "Q." Maintains a fairly constant "Q" over the lower ham bands. Operates with a minimum of losses . . . meaning more QSO's. Positive action, silver-plated roller assures steady signal that will stay put. Simple one-shot tuning for any band. "Get 6 Bands on 1 Coil."

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For 40-20-15-11-10 Meters

Another first and finest with Master Mobile, the new Hy "Q" non-linear "variable spaced" Mighty-Midget . . . engineered to provide the highest "Q" consistent with good mechanical design. Compact, extremely rugged, yet lightweight, its operation assures precision tuning with the new adjustable silver-plated roller that stays put! Perfect for 40-20-15-11-10 meters. "Get 5 Bands on 1 Coil."

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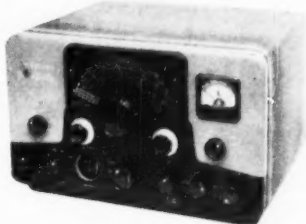
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- ★ Instant start, stop — no waiting
- ★ Communications type Vibrator
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Pad (70 blanks) 35¢  
 Message Delivery Cards  
 each 2¢ plain, 4¢ stamped

## Dx Contest Results

(Continued from page 50)

## GREAT LAKES DIVISION

W3EH (W3 4-5-B-1)	<b>GREAT LAKES DIVISION</b>
W3CB (W3C CLR DHM)	<i>Kentucky</i>
W3IMV (73 104-105-236-C-48)	7260-44-55-B-18
W3JNP (73 14P 1M)	
W3JNQ (W3B ALB JNC)	<i>Michigan</i>
W3KT (35 55-79-150-C-33)	W3DTS 3720-31-40-C-15
W3KT (W3C KT OX)	W3NJO (W3C CLR DAO)
W3CG8 (W3C GS8 GHF)	<i>MNZ NGO</i>
W3IGW (W3C IGW GWT)	67,098-106-211-C
1226-39-49-B-24	

<i>Mid-1940's, C.</i>		<i>W&amp;NW F</i>	
W3GRF	17 490- 63-110-4-15	W&NW F	46 920-92-270-3-63
W3JTC	16 854- 53-106-3-15	W&NBH	41 310-90-157-2-30
W3JRD	11 448- 55-162-3-34	W&BRT	40 599-90-109-2-20
W3EIS	300-10-10-B-5	W&SCT	17 658- 54-109-3-20
W3BYO	144- 6- 8-B-13	W&SAC	17 280- 60-96-1-15
W3CDE	84- 4- 7-B-4	W&SPD	17 025- 45-88-3-15
		W&SPD	9576- 42- 78-3-33
		W&SAD	8580- 44- 65-16-16
		W&SAC	369- 6- 6-1-1
		W&PLN	3436- 32- 63-2-21
		W&SWM	1512- 18- 28-7- 7
		W&SPC	1224- 17- 24-A-20
		W&SPM	180- 6- 6-1-1
		W&SDMD	147- 7- 7-1-6
		W&SRF	36- 3- 3-1-1
		W&SCL	136- 3- 3-1-1

## HUDSON DIVISION

W2UTH	42-	12-	12-B-	6	<i>Eastern New York</i>
W2QZI	147-	7-	7-C-	5	
W2TXB	3-	1-	1-C-		
<i>Western Pennsylvania</i>					
W2MHE	702-	13-	18-B-		<i>W2OKI K2DQH</i>
K2DQH	90-	5-	6-B-10		

## CENTRAL DIVISION

<i>Illinois</i>	W2BR	15,696	48-109-B-65
	W2GN	108	6- 6-B-1
	<i>Northern</i>		
W9GR	22,035	65-113-C-45	
W9HA	18,360	60-102-C-32	
W9WK	48,960	34- 49-B-30	
W9PNE	10,880	17- 22-A- 9	
W9DQV	60	4- 5A- 8	
W9G (W9s GYZ			
(PWK)			
	96,204	117-275-C-96	
	W2BR	15,696	48-109-B-65
	W2GN	108	6- 6-B-1
	<i>Northern</i>		
W2GL	15,066	54- 93-C-15	
W2GNG	3,375	25- 45-C- 7	
W2YTH	2,268	18- 42-B-18	
W2G	11,552	16- 24-B-16	
W2EOS		2- 4-B-	

## MIDWEST DIVISION

W'YM	105	5	7-B		<i>Komovs</i>				
W'W	61	166			W'W'W	11	925	53	75-C-36
W'W'W	17	106-119	172-A-45		W'W'W	3700	25	50-B-24	
W'W'W	23	10	10		W'W'W	2142	21	34-B	
W'W'W	1035	15	13-B-27		W'W'W	48	4	4-A-2	
W'W'W	675	15	15-B-3						
W'W'W	540	10	10-A	5	<i>M'W'W</i>				
W'W'W	324	9	12-A-6		W'W'W	4216	34	42-C-10	
W'W'W	243	9	9-A	8	W'W'W	4213	26	42-B-18	
W'W'W	138	7	7-B	8	W'W'W	26	37	42-C-1	
W'W'W	120	5	8-A	3	W'W'W	576	12	16-B-5	
W'W'W	105	7	7-B	10	W'W'W	465	11	14-B-35	
W'W'W	105	7	7-B	10	W'W'W	3	1	1-B	

## DAKOTA DIVISION

	North Dakota	W0BBB	11,088-	48-	77-C-
		W0GKL	9522-	46-	69-C-26
W0EOZ	495-	11-	15-B-	5	

NEW ENGLAND  
DIVISION[illegible]

## DELTA DIVISION

Louisiana		Maine	
W5JUF	19 251- 69- 93-15-23	W1DEL	21 065- 55-129-C-70
W5KC	7296- 38- 64-A- 8		
W5FR	644- 14- 16-B-		
Eastern Massachusetts			
Mississippi			
W5YBF	132- 6- 8-A-10	W1JEL	55 800- 95-196-C-52
K5FBB (W5s AZL MTC)		W1PST	14 100- 50- 94-C-40
W6K1G		W1MKW	1462- 17- 29-A-4
		W1ZTC	792- 11- 24-C- 6

21,656- 62-117-B-44	<i>Western Massachusetts</i>
<i>Tennessee</i>	W1ZD 34,861- 71-164-C-33
W4DQH 105,480-120-295-C-63	<i>New Hampshire</i>
W4NBV 49,728- 84-198-C-72	
W4FKA 5250- 35- 50-B-17	W1FZ 13,776- 41-112-B-

# The New -- 20 METER



## SHORT BEAM

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## ... 3 ELEMENT ROTARY BEAM

The new RADIO SPECIALTY 20 meter short beam is precision tuned and tested—assuring premium performance and dependability. You get "top man on the frequency" results even in a limited area installation. It is engineered to provide you with a truly practical, light weight, all weather structure with all these superior specifications—

- Element lengths, 16 feet (approximate).
- Boom—16 feet.
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- Turns with a T.V. Rotator.
- Front to back ratio better than 20 DB.
- Designed for 52 ohm coax.
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- Reflector spacing .15 wavelength.
- Pre-tuned for 20 meter phone band.
- 615T aluminum used for elements, boom, crossarms and mast.
- One man installation.

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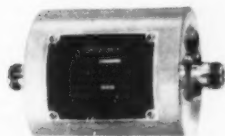
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# ROTARY BEAM KITS

**3 ELE 20 METER** 24' 2" SQ. BOOM, Tilting beam mount, 1 1/2" ele., 1 1/4" telescoping ends.  
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Same as above with 1 1/4" ele. with 1" ends @ **\$89.95**

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#### Montana

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#### Oregon

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W7DAA 1581- 17- 31-C-13

W7AHX 297- 9- 11-B-5

#### Washington

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W7POE 2346- 17- 46-C-10

W7ICD/7 608- 3- 7-B-4

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W7JCO 324- 9- 12-C-4

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W5HRP/4 4998- 34- 49-B-27

W4HWW 3024- 28- 36-C-6

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W4COW 1783- 21- 29-A-11

W4HQN (W4 HQN NTZ) 122400-120-340-C-75

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W01NF 1170- 15- 28-B-18

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W6NZW 384- 8- 16-C-1

W6NSW 360- 6- 20-B-15

W6SWL 210- 5- 14-B-4

W6NJI 144- 4- 12-A-5

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W5VJB (W5VJB W7PL) 429- 11- 17-B-7

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W5KBU 2508- 22- 38-A-16

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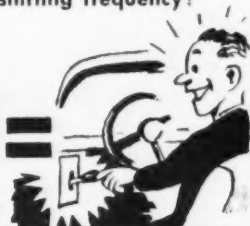
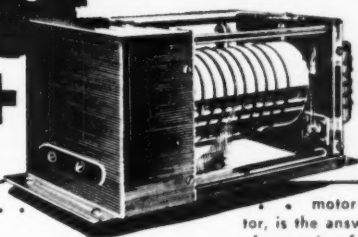
(Continued on page 142)



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Z81JD 4225- 13-109-A- 7

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Z81JD 4225- 13-109-A- 7

### ASIA

#### Japan

KASSC 2255- 11- 69-C-17

JA1GV 267- 3- 30-B-

JA3HB 96- 3- 10-B- 7

JA1EP 24- 1- 8-A- 2

JA6AE 20- 1- 6-A- 3

JASAA 15- 1- 5-B-

JA3BR 6- 1- 2-A- 1

JA3PK 6- 1- 2-A- 1

JA1BO 3- 1- 1-A-

JA1JB 3- 1- 1-A-

JA2AN 3- 1- 1-A-

JA3CF 3- 1- 1-A-

#### Turkey

TA3AA 5424- 16-113-B-21

### EUROPE

#### Azores Islands

C83AC 16,560- 18-314-B-23

#### Belgium

ON4OC 664- 8- 28-A-10

ON4LJ 306- 6- 17-A-

#### Czechoslovakia

OK1MB 2076- 12- 59-A-

#### Denmark

OZ5KP 1332- 12- 37-A-11

#### England

G2PU 17,733- 23-257-B-19

#### Finland

OH1PN 12- 2- 2-A-

#### France

F7CZ 6454- 14-155-A-

F9RM 780- 10- 26-A- 6

F9KD 72- 4- 6-A-

#### Germany

DL4NO 7218- 18-136-B-29

DL4WZ 3032- 14- 76-B-

DL1KB 2060- 10- 69-B-27

DL1UN 2016- 14- 49-B-11

DL19N 1188- 9- 44-B-13

DL1ZC 12- 2- 2-B-

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#### Greece

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E15I 7875- 15-175-B-

#### Italy

HCQD 7106- 17-140-A-

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PA0ULA 1197- 9- 45-B-12

PA0VB 976- 8- 41-B-15

PA0ND 497- 7- 24-A-

#### Norway

LA6YC 480- 6- 27-A- 7

#### Portugal

CT1SQ 6575- 25- 88-B-

#### Scotland

GM3EOJ 117- 3- 13-B- 5

#### Spain

EA4DR 10,440- 20-177-B-

EA4DL 6783- 17-133-B-

### Sweden

SM2VP 1620- 12- 45-B-12

SM5FA 666- 6- 37-B-

### NORTH AMERICA

#### Alaska

K17AON 70,431- 51-464-B-32

K17AWB (K17s AOW AWB) 6000- 20-103-C-45

#### British Honduras

VP1GG 9062- 23-133-A-13

#### Canada Zone

KZ5DG 1431- 9- 54-A-

#### Cuba

CO2RM 16,458- 26-211-A-

CO2GO 6817- 17-135-A- 9

#### Guantanamo Bay

KG4AT 22,152- 39-193-B-16

KG4AE 640- 10- 23-C-

#### Haiti

HH3RC 22,638- 33-229-A-19

#### Honduras

HR1EM 5940- 15-132-B-

#### Mexico

NE1OE 18,678- 33-190-A-20

NE2W 12,640- 32-134-A- 5

NE1QB 12,462- 31-138-A-12

NE1TR 8717- 23-127-B-17

#### Nicaragua

YN4CB 22,137- 27-280-A-

#### Panama

HP3FL 100,296- 63-536-B-28

#### Puerto Rico

KP1YC 63,916- 38-569-A-52

KP1KD 6048- 24- 84-A-

#### St. Pierre & Miquelon Is.

FP5AP 2232- 9- 83-A-

#### Virgin Islands

KV1AA 3- 1- 1-B-

### OCEANIA

#### Australia

VK5NN 456- 8- 19-A-

#### Hawaii

KH6IJ 175,044-58-1006-C-61

KH6MG 143,134-59- 811-C-53

KH6AY 33,981-36- 316-C-57

KH6PM 33,480-40- 279-B-23

KH6AN 12,540-22- 190-A-23

KH6AN 903- 7- 43-B-

KH6ABY 864- 6- 48-A-

KH6AWM (KH6s AWM BBB, W5CMY, WH6s BBJ BEO, W9CIN) 142,782-53- 911-B-80

#### New Zealand

Z1IMQ 8225- 25-110-A-16

Z12BQ 1230- 10- 41-A- 2

#### Philippine Islands

DU78V 1744- 8- 73-B-

### SOUTH AMERICA

#### Antarctica

LU7ZE 822- 8- 31-A-

#### Argentina

LU1EQ 40,618- 46-299-B-50

LU5DB 7500- 25-100-A-16

LU7BQ 3363- 19- 59-A- 7

#### Brazil

PY4KL 10,773- 19-189-B-

PY4RN 8520- 20-142-A-25

PY1AQ 8424- 26-109-B-15

PY3AGP 7860- 20-393-B-

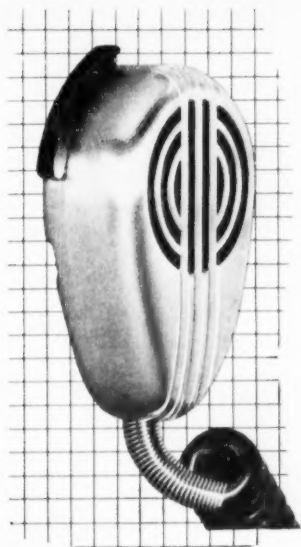
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(Continued on page 144)

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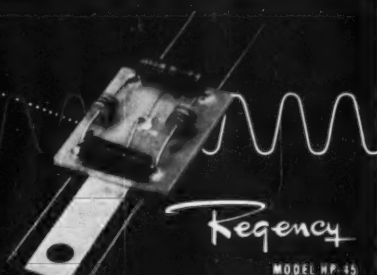
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	ZP5CF	2262- 13- 58-A-
Chile		
CE6AR 2499- 17- 49-A-	Uruguay	
	CX5AF	1290- 10- 43-C- 1
Neth. West Indies		
PJ2AF 41,344- 34-412-B-31	Venezuela	
PJ2AB 5040- 14-121-A-12		
PJ2CL 4407- 13-116-A-32	YV5DE	1722- 14- 42-A- 6
PJ2CE 972- 9- 36-A- 6	YV5FK	1590- 10- 53-B- 4

1 W3WPY, opr. 3 Hq. staff — not eligible for award. 3 W1VQG, opr.

## SET

(Continued from page 72)

tored for stations calling with traffic, in addition to the National Calling and Emergency Frequencies.

National Calling and Emergency Frequencies are for calling only. When contact has been made, QSY to another frequency to handle traffic. The cooperation of all amateurs has been solicited to keep these frequencies clear for this purpose on the October 9th-10th week end.

In Canada, Red Cross traffic should be forwarded to Canadian National Red Cross headquarters in Toronto, civil defense traffic to Provincial Civil Defense headquarters. Canadian ECs send their SET reports to ARRL, same as all ECs. Designated Canadian National Calling & Emergency Frequencies are 3535, 3765, 7050, 14,060, 14,160 and 28,250. The TEA from W1AW will not be transmitted on these frequencies, however.

Due to the TEA we expect more traffic this year; therefore, all amateurs who can possibly do so are urged to help out on the NCE frequencies in relaying this traffic, in addition to participating in your local test. Regional and Area nets of the National Traffic System will conduct extraordinary sessions on their regular frequencies to assist in expediting this traffic, just as they would in a real emergency.

Fellows, let's make like this is a real emergency and all traffic is urgent. It is the annual face of the Amateur Radio Service to the public and to the nation. Invite the press to your demonstration, then do a good job. You won't be perfect (who is?), but you'll be able to demonstrate that amateur radio is on the alert, ready to do its part when the chips are down. See you October 9th-10th, O.M.s!



**25 Years Ago**  
this month

October 1929

The editorial sums up ARRL's past and continuing efforts toward the enhancement of amateur radio's favorable domestic and international status.

ARRL President Hiram Percy Maxim, W1AW, in "Lifting the Bushel," suggests that we amateurs can more effectively enlist public good will, for mutual benefit.

"A Worth-While Combination," by Dale Pollack, W2AEC, rolls a monitor, frequency meter and receiver into one compatible and portable unit.

Technical Editor James J. Lamb takes us on an informative tour of 50-kw. b.c. station "WTIC" and provides a ham's-eye view of broadcasting techniques.

The Experimenters' Section features several practical detector-amplifier circuits employing the UY-224 and UX-222 screen-grid tubes now becoming popular.

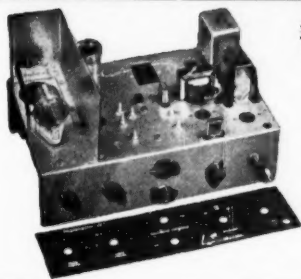
"G5BY," the famed Surrey, England, station owned and operated by H. L. O'Heffernan, is the sixth of a QST series depicting modern amateur installations.

"KHEJ and the 'Untin' Bowler," by Communications Manager F. E. Handy, reports on amateur participation in the famous Chicago-Arctic flight.

Communications Department pages feature operating hints contributed by W1AY and W9DQD, Navy Day Competition notes and a full roster of OBS volunteers.

In a "Doings at Headquarters" column we note that George Grammer, W3AIIH, has joined the League staff, assuming Technical Information Service duties.

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Up to 50 watts output.  
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### New "TENACLIP" (Pat. Pend.)

attaches to car... stops antenna whipping

Clear plastic clip quickly fastens to rain molding... holds right or left antennas. Prevents damage to antenna from low hanging limbs or driving into garage. See your dealer or order direct. No C.O.D.'s please.

PLASTICLES, 4297 GRAND RIVER, DETROIT 8, MICH.

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BC-221 Frequency Meters. Can use any quantity and any nomenclature provided only that the set is complete with original calibration book.

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Now! — 3½ KC selectivity. The new model "B" is a fixed frequency mobile receiver for converters with choice of 3 different IF selectivity curves. Compact and completely self contained with a built-in 6 & 12 volt power supply, noise-limiter, BFO, speaker, RF gain control and T-R switch. It supplies filtered A, B+ and AVC for the converter.



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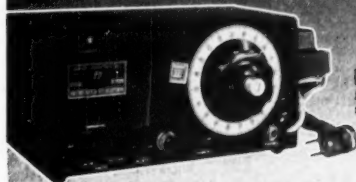
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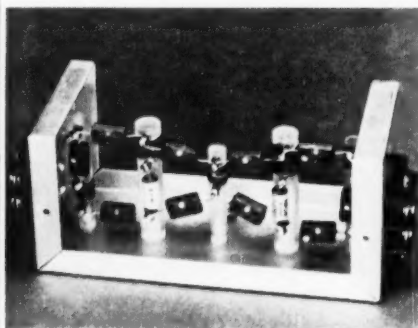
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# As SEEN in QST

July 1954  
page 32

## TVI Tips



High-Pass Filter

## INTERFERENCE

QST has led the way in solving the problems of television interference — first, by helping League members clean up their rigs, and second, by providing guidance from the public-relations viewpoint. In the most recent 12 issues there have been

**16** articles, containing  
**36** illustrations, using  
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dealing with both aspects of the situation. More are coming. Don't miss any!!!

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**THE AMERICAN**  
**RADIO RELAY LEAGUE**  
**WEST HARTFORD 7, CONNECTICUT**

## YL News and Views

(Continued from page 65)

Thursday of the month. YLRI, Second District Chairman W2JZX hopes W2 girls will thus have an opportunity to become better acquainted. . . . W8HUX, Marvel, received certificate No. 2 issued for working Ohio's 88 counties. . . . W4BWD's OM, W4ZWT, gave her "an old tin chassis and a box of junk and said 'start building.'" Helen did just that and as a result is on 80 c.w. regularly with a little rig of which she's justly proud. . . . During a recent event-packed trip to California, W2EEO, Madeline (and OM W2CYK) met a number of the Los Angeles YLRC members and was guest of the San Francisco YLRL. . . . W7SBS, Lorynne, reported seeing the following YLs at the Oregon Amateur Radio Association Convention at Klamath Falls: W7s GLK HHH ITZ JFM NJS NTT RAX SBS SBW SBX CFN (convention president), WN7VLI and K6CXZ. . . . W4BLR, Kay, is editing the new YL column "Virginia Belles" in the Virginia Section Bulletin. . . . W2s AMZ KEB NAI and ONC attended the Second Regional Phone Net picnic at Albany on July 4th. . . . W2WCL, Kay, is Assistant Director of the Hudson Division. . . . OM W0HAW of Hamlin, Kansas, tells of two active YLs—W0HQH, Carol Ann of Dunbar, Nebr., and W0MPB, Dorothy, of Topeka, Kans. . . . After attending the V.H.F. Hamfest at Turkey Run State Park, Indiana, in July, W4UDQ, "DB" and OM W4HHK spent two weeks visiting other v.h.f. enthusiasts of the East, including W8BEQ, Margaret, OM W4HDQ and W4AO. . . . OM W6HC, vice-director of the Pacific Division, spoke about traffic handling and the functions of the NTS to the YLs who attended the ARRL Pacific Division Convention at San Jose. W6QMO, Jerri, was in charge of the YLRL meeting.

## Hamfest Calendar

(Continued from page 10)

friends you've worked on the air. Tickets purchased in advance, \$2.00; at the door, \$2.50. Contact the Secretary, Viola Grossman, 18 Phipps Ave., East Rockaway, L. I., New York, for reservations.

**OKLAHOMA**—The Tulsa Amateur Radio Club will hold its Hamfest at Tulsa, Okla., on Sunday, October 10th. There will be no speeches. Face-to-face rag-chews, contests, a special entertainment program for the XYLs, as well as good food, will complete the program. Hams and their families and SWLs and friends of hams are invited. Contact W5KY.

**TEXAS**—Sunday, October 10th, will be Amateur Radio Day at the Texas State Fair. Registration starts at 8 A.M. with a program at 3 P.M. The picnic pavilion and play area are reserved all day with the activities centering around the pavilion. An attendance of 1000 hams is anticipated.

Of equal importance is the booth in the General Exhibits Building donated gratis by the State Fair for setting up a ham station. Two complete TVI-free transmitters will be operated (during the open hours of the Exhibit Building) for the full run of the Fair, Oct. 9th-24th. Also included in the ham station booth will be two television sets—one a clean set of good design which can operate satisfactorily next to a TVI-free transmitter, the other set to be one that can be cleaned up by the installation of a high-pass filter. A short, clearly-worded but to-the-point pamphlet on TVI will be passed out to the public. Along with the TVI demonstration, messages will be accepted from the public for transmittal to all parts of the country.

## MEMBERSHIP CHANGES OF ADDRESS

Four weeks' notice is required to effect change of address. When notifying, please give old as well as new address. Advise promptly so that you will receive every issue of QST without interruption.

## HAM-ADS

(1) Advertising shall pertain to radio and shall be of nature of interest to radio amateurs or experimenters in their pursuit of the art.

(2) No display of any character will be accepted, nor can any special typographical arrangement, such as all or part capital letters be used which would tend to make one advertisement stand out from the others.

(3) The Ham Ad rate is 50¢ per word, except as noted in paragraph (6), below.

(4) Remittance in full must accompany copy. No cash or contract discount or agency commission will be allowed.

(5) Closing date for Ham-Ads is the 20th of the second month preceding publication date.

(6) A special rate of 7¢ per word will apply to advertising which, in our judgment, is obviously non-commercial in nature, and is placed and signed by a member of the American Radio Relay League. Thus, advertising of bona fide surplus equipment owned, used and for sale by an individual or apparatus offered for exchange or advertising inquiring for special equipment, if by a member of the American Radio Relay League take the 7¢ rate. An attempt to deal in apparatus in quantity for profit, even if by an individual, is commercial, and all advertising by him takes the 50¢ rate. Provisions of paragraphs (1), (2) and (5), apply to all advertising in this column regardless of which rate may apply.

(7) Because error is more easily avoided, it is requested signature and address be printed plainly. Typewritten copy preferred.

(8) No advertiser may use more than 100 words in any one issue nor more than one ad in one issue.

Having made no investigation of the advertisers in the classified columns, the publishers of QST are unable to vouch for their integrity or for the grade or character of the products or services advertised.

**QUARTZ**—Direct importers from Brazil of best quality pure quartz suitable for making piezo-electric crystals. Diamond Drill Carbon Co., 245 Madison Ave., New York City 16.

**MOTOROLA** used communication equipment bought and sold. W8RC, Ralph Hicks, 204 E. Fairview, Tulsa, Okla.

**SUBSCRIPTIONS**, Radio publications. Latest Call Books, \$3.50. Mrs. Earl Mead, Huntley, Montana.

**WANTED**: Cash or trade, fixed frequency receivers 28-42 Mc. W9VIV, Troy, Ill.

**WANTED**: All types of aircraft radios, receivers and transmitters. Absolutely top prices. James, W2KUH, 908 Hickory St., Arlington, N. J.

**DON'T Fail!** Check yourself with a time-tested Surecheck Test. Novice, \$1.50. General, \$1.75. Amateur Extra, \$2. Amateur Radio Supply, 1013 Seventh Avenue, Worthington, Minn.

**WANTED**: Early wireless gear, books, magazines and catalogs before 1925. W6G-H, 1000 Monte Drive, Santa Barbara, Calif.

**CODE** slow? Try new method. Free particulars. Donald H. Rogers, Ivyland, Penna.

**POSTCARD** brings you free information on your Amateur Desk Signs and money-saving club purchase plan. Hawkins Distributing Co., Paupack Terr., East Moriches, N. Y.

**CRIPPLES** specials! RK-1 Cable 100 ft. \$5.95, 250 ft. \$12.25, 500 ft. \$25.00. Commercial—PL-259 S for \$2.25, 50 ft. 19 S for \$2.00. New tubes—807 \$1.65, 811A—\$4.25, 812A—\$3.50, 813—\$10.50, 866A—\$1.48, 104TH—\$8.75, 822A—\$9.95, 24G—\$1.85. Postage extra. Request free bulletin and visit our new store for thousands of bargains. Want to buy or swap? Selenium, Synchron, Servo Motors, Amplifiers, RIA-H Aircraft Radio.

Electronic Research, 719 Arch St., Philadelphia 6, Pa.

**URGENTLY** need AN/APR-4 items. New high prices. Littell, Far Hills Branch, Box 26, Dayton 9, Ohio.

**RK-4D-2**, brand new, \$17.50 postpaid. W5ANL.

**HOTTEST** Ham List in the nation! Trades-ins and closets of all leading Amateur brands including Collins, National, Johnson, Hallicrafters, Gonset, Elmac, Morrow, Harvey Wells, RME, Millen, Meissner, Sonar. We trade and offer our own time payments (tailor-made for you). All leading brands of new equipment in stock. Write for latest bulletin. Stan Burghardt, W9BJV, Burghardt Radio Supply, Inc., Box 41, Watertown, South Dakota.

**NEED** ARC-B Bill O'Connell, 4908 Hampden Lane, Bethesda, Maryland.

**NOMINAL** Trade-in will bring you \$90 allowance on new Barker & Williamson transmitters, Hallcrafters HT-20, or any model Concoction tape recorder, \$100 on S-V, \$85, \$60.00 on Viking II, \$40.00 on Viking Ranger, or Elmac AP-67, \$30.00 on Elmac receivers or Penton tape tape recorders, 20% on Lansing, Stephens, Fisher, etc. Hi-Fi components. Order specific bargains! Telcel, Azurelle Dome, Malibu, Calif. Tel. Globe 6-2611.

**WANTED**: RC-348 receiver. W. Richards, 4908 Hampden Lane, Bethesda, Md.

**NEED**: ART-13, R. Ritter, 4908 Hampden Lane, Bethesda, Maryland.

**WANTED**: RC-348 receivers. Write James S. Spivey, Inc., 4908 Hampden Lane, Washington 14, D. C.

**TRANSFORMERS** while they last! \$50VCT 60 90 mile with 6 VCT 60 1 1/2 A. cased, \$2.00 each; 700 VCT 60 90 mile with 6 VCT 60 1 1/2 A. cased, \$2.20 each; 5260VCT 60 1/2 amp. ICS, \$49.00 each. Grand Transformers, Inc., 226 Washington St., Grand Haven, Michigan.

**WANTED**: Bargains in transmitters, receivers, laboratory and test equipment, money, power supplies. Especially need plate transformers (putting out 4000 V or more each side center, filter chokes, condensers, miscellaneous gear, etc. What have you? Please state price desired. Harold Schonwald, W5ZZ, 718 No. Broadway, Oklahoma City 2, Okla.

**QSL'S** SWLS? America's Finest — and largest variety of samples, 25¢ (refunded). "Rus" Sakkers, W8ED, P.O. Box 218, Holland, Michigan (Fall Catalog, \$3.50).

**QSL'S** SWLS? Meade W8KXN, 1507 Central Avenue, Kansas City, Kansas.

**QSL'S** of distinction. Three colors and up. Uncle Fred, Box 86, Lynn, Penna.

**DELUXE** QSL'S. Petty, W2HAZ, Box 27, Trenton, N. J. Samples, 10¢.

**QSL** SWLS, Samples, free. Bartoski, Houston, Me.

**QSL'S** Samples free. Albertson, W4H D, Box 322, High Point, N. C.

**QSL'S** Two colors, \$2.00 hundred. Samples for stamp. Rosedale Press, Box 164, Asher Station, Little Rock, Ark.

**QSL'S** "Brownie," W4CJL, 3110 Lehigh, Allentown, Penna. Samples 10¢, with catalogue, 25¢.

**QSL'S** Taprint, Union, Mississippi.

**QSL'S** Samples, 10¢ C. Fritz, 1213 Briargate, Joliet, Illinois.

**QSL'S**: Beautiful blue, silver and gold on white glossy stock. \$3.85 per 100. Two-day delivery. Satisfaction guaranteed. Rush order and get surprise of your life. The Constantine Press, Bladensburg, Md.

**QSL'S**: Kromette. W1KMP, 6, Dauphine, Box 78374, Los Angeles 16, Calif.

**QSL** SWL cards, Sensational offer, Bristol stock 500 1 color \$3.95, 2 color \$4.95, 1 color \$5.95. Super glossy \$1.25 extra. Rainbow cards. Samples QSL, Box 71, Passaic, N. J.

**QSL'S**, SWLS. High quality. Reasonable prices. Samples. Write to Bob Teahout, W1EEN, Box 9124, Rutland, Vermont.

**QSL** samples. Dime, refunded. Roy Gale, W1RD, Waterford, Conn.

**QSL** the way you want them. Samples 10¢. VERN'S Print, 729 Jun, Hutchinson, Minnesota.

**QSL'S** Postcard brings samples. Fred Leyden, W1NJZ, 454 Proctor Ave., Revere 51, Mass.

**QSL'S** Personalized, 150, \$2.00. Samples, 10¢. Bob Garra, Lehighton, Penna.

**QSL'S** SWLS, 100, \$2.85 and up. Samples 10¢. Griffith, W8SW, 1042 Pine Heights Ave., Baltimore, Md.

**QSL'S** "America's First Choice!" Interesting samples 10¢. Tooker, Press, Lakehurst, New Jersey.

**QSL'S**. Free samples. Printer, Corwith, Iowa.

**QSL'S** SWLS. Cartoons, rainbows, others. Quality. Reasonable. Samples 10¢ refunded. W2JME, Joe Harris, 225 Maple Ave., No. Plainfield, N. J.

**QSL'S**. Photographic. From your negatives or material kits. Write for sample. G. L. Photo Service, Bensenville, W9IRE, 10728 N. Washtenaw Ave., Chicago 43, Ill.

**CANADIAN** QSL'S. Stamp for samples. Beynon, VE4WV, Collingwood, Ont., Canada.

**QSL'S** of quality. Reasonably priced. Samples 10¢. Beseparis, W9CC, Beseparis Printing, 207 S. Balinet St., Frackville, Pa.

**CANADIAN** QSL'S. Catalog 10¢ (refunded). Hattie, VE1NL, Box 166, Trenton, Nova Scotia.

**WANTED**: March, May, June 1916 OST. Sell four or more OST's 1916 to date, 25¢ each. W0MCC, 1022 N. Rockhill Rd., Rock Hill 19, Mo.

**URGENTLY** NEED AN APR-4 items, particularly Tuning Units for important defense contract. New high prices. Engineering Associates, 434 Patterson Road, Dayton 9, Ohio.

**NEON** GLO plastic desk call signs, two by eight inches — \$2.00 postpaid. Roy Hulvey, W9PLW, 4425 Johnson, Gary, Ind.

**YOU** are there! Read ham history as it happened. Learn tricks the Old Timers employed to work out so well. Selling 1920 through 1947 (OST's). Postcard brings details. Walter Lindgren, W2AJR, Box 1158, Southhampton, N. Y.

**NEW** crystals for all commercial services at economical prices, also regarding or replacement crystals for broadcast, Link, Motorola, G.E. and other such types. Over 19 years of satisfaction and fast service. Send for L-7 catalog. Edison Electronic Co., Temple, Texas.

**SSB** FT-241-A guaranteed crystals. Individually precision measured then marked true exact frequency. \$1.00 each, postpaid. Selected set of 8 especially for lattice filter per \$3.50 each. Orco Products, Box 51, Downey, Calif.

**VIKING** I, in excellent condition, needs new 4D32 tube, otherwise perfect: \$150.00. 90 day old Hammarlund HQ140, used less than 20 hours: \$200.00. George Payne, 1314 So. 1st St., W8KHR, Omaha, Neb.

**SELL**: Gonset TriBand, MicroMatch, meters and more. W9C VD, Smaech, 6145 West Edly, Chicago 34, Ill. Tel. PALAISE 5-767.

**RC-458** and power supply, \$25.00. Herbst, 39 Lucile, Dumont, N. J.

**TELETYPE**: Model 26 (see RTTY News, Dec. 1953). Trade machine and HQ 120X both excellent condition, for HRO-60 Machine only for HRO-50. W9SFN, Matthews, 1210 East Court Avenue, Jeffersonville, Indiana.

**COLLINS** H0B exciter, de-TV'd. Brand new, latest type VFO, all coils, manual, plus turret: \$225. W4VO/I, 119 Eustis Avenue, Newport, R. I.

**SELL**: RC-48N, 28v. dc, \$90. RC-48R, converted to A.C. new panel, \$75. 655r, Navy R23 v. dynamotor, new, \$25. RC-48G coil assemblies, RF-491, Det. #192, new, \$7 each. QST's, back issues 25¢ each. All plus shipping. M. J. Marshall, 455 Washington Ave., Dumont, N. J.

**FOR** Sale: Two 810s, brand new, \$7.50 each, RD-77 dynamotor, new, \$10. Kenyon filament transformer for pair 304TLS, 5 vct at 60 amps, 115 v. pri., \$12.50. Wanted: Used, factory built Central Electronics 10-A. State price and condition. Elvin Miller, Broadway at State Albany, Indiana.

**TRADE**: Leica camera for transmitting gear. Dr. Emil P. Reed, Doctors' Building, 1422 South Tyler, Amarillo, Texas.

**WILL** Swap or Sell. New RB-2 Panadator, never used, \$150. Motorola T6920A, 10-meter mobile complete, ready to operate on 28.800 Kc., \$40. GFI mobile or fixed 40-80 transmitter, \$30.00. TU-18 receivers, \$40.00 each 50¢. Viking TVF'd and Collins 110C, \$275.00, will sell separate. Power transformer, 2500 v. d. c., 1 amp., \$15.00. 1500 vdc, 1 amp. \$25.00, 850 v. 1000 ml., \$15.00, 750 v. 250 ml., \$12.00. 30-watt Webster PA, \$30.00. Weston model 765 voltmeter, AC/DC, 1500 v. 30 decibels, \$30.00. Address replies to Radio, Box 550, Little Rock, Arkansas.

TRANSMITTER, 6146 final, 90 watts c.w., 80-40-20 almost new, TVI-proofed, with diagram and instructions. \$65.00. Hallcrafters SR-75 Novice transmitter, never used. \$60.00. Will buy small lots surplus tubes in cartons. Palmer's, 408 S. LeBaron, Mesa, Ariz.

TELESCOPIC Aluminum tubing: All sizes. 1/2" x .058 wall, 12¢ per ft. 1/4" x .058 wall, 14¢ per ft. 3/8" x .058 wall, 22¢ per ft. All sizes stocked. Handy Tool, Inc. P.O. 142, Tilton, N. H.

SELL: Collins HOC-2 exciter. Best offer over \$100. Write John McNamara, Anamosa, Iowa.

SELL: S-38C receiver, new condition, \$30.00. W2LNC, Wilkes, N.E. Dudley Ave., Westfield, N. J.

3/4 KW. Final, 4-250A, power supply, TVT-4, 30 ft ladder tower, rotor, 3-10 meter beam. Lyco 600, Hallcrafters S-20R, 3 chassis 90 watt hi-fi audio, Shure 556, touch-talk stand, and loads more. Student needs money, everything must go! \$375 cleans the shack. Malcolm Randall, 302 Newton, P.U.C. Extra, Calif.

SELL: HT-9 coils for 80-40-20 P.O. extra 814, \$150.00. Lyco 600, 30 W. VFO, all bands, de-TVFD, 10-pass filter, like new, \$90.00. P.O. Wausau, Goetz, W9RQM, 929 So. 7th Ave., Wausau, Wisconsin.

HARVEY-WELLS TBSOA, exc. condx, \$70, reconditioned #12 teletypewriter, \$50, unused 12CPT, \$8, little used disc recorder with playback \$15.00, wanted: KW gas driven generator. Andrew Stavros, WAKE, 116-12 132 St., South Ozone Park, N. Y.

SELL: HO129X with speaker, fine condition, \$160. P.O. Parkridge, Illinois W9AVI, 2003 Newton Ave.

TRADE Harvey Wells Bandmaster Deluxe wired for push to talk and PE-101 Dynamotor for 750 watt 8 mm. projector, W9AIO, Lewis West, 314 West St., Louisville, Ky.

FOR Sale: HRO-60 coils A, B, C, D, E, F, crystal calibrator, less speaker, like new, \$475.00. P.O. Baltimore, Md. R. E. Ridenour, 839 Woodlawn Parkway, Baltimore 29, Md.

SELL: Hammarlund Super Pro, SP200X, pwr supp & spkr with VHF 152A, both in perfect condition. \$135.00. Not surplus! J. Calamia, 6199 12th Ave., Brooklyn, N. Y.

SELL: 75W c.w. xmtr, \$65, 15W c.w. xmtr, \$25, simple modulator 6N7-6V6, \$12, Larry Rose, W9ALO, Mounds, Ill.

VIKING II and Viking VFO, both factory-wired, 6 mos. old, In-cludes mike, bug, Balun coils, 33 ft. vertical: \$300. SX-71 and R-46 stealer, \$175. All inquiries answered. W9COW, 11606 Valley, Ca. 28, Ill. Tel. PG 1225.

SELL: Like new, VHF 152A, \$50, also like new TR4-144-48 Mc xmtr; recvr: \$25, both for \$70. W2MLQ, Geo. H. Schmitz, 17 Butler St., Pompton Lakes, N. J.

SX-71, new, \$200. Lettine Model 240 with all band coils, \$50, Inner 10-X mike, \$8. W1RPE, 28 Myra Road, Hamden, Conn.

VIBRAPAC K Mallory VP551, new, \$17, grid dip oscillator. \$10. Sell or trade for photo enlarger. W6EVB, 789 Garland Dr., Palo Alto, Calif.

MUST Sell: Eldico TR751V with crystal and 80 meter coils: \$45.00, code practice oscillator, \$6.00. W9YFV, W. Jannick, 1811 N. Lowell Ave., Chicago, Ill.

3 HOKES: Kit of 10 assorted, 1.00 postpaid, 30-50, 144-152, 220-25 Mc, current production, not surplus. Manufacturers write for electrical specs and quantity prices. Lakeland Electronics, Dept. 100, Waukegan, Ill.

FOR Sale: One model K-8 Presto disc recorder, used but in gud condx. Cash \$100. Also 6 volt, 10 amp battery, pwr supp. for National HRO-60 recvr, \$40. Both F.O. Boston W1WGM.

HAMS! Write to me for the best deal in new ham gear. Full factory guarantee. No trades. Pay cash and save. "Older Rex", 258 Park Square Bldg., Boston 16, Mass.

ATTRACTIVE clear plastic covers for those rare QSL cards. 10 for \$1.00 p.p. plus postage. 15¢. Quantity discounts. Forrest Hothem, W8WJY, Rt. 43, Cochocton, Ohio.

SELL: HRO Jr. G.C. and 20 M. B.S. coils, \$40, RAS coils #1, 2, 3, 6, and coil cabinet, \$5 each. Would trade for Hi-Fi Sinclair, W4BMC, 91 Karland Dr., N.W., Atlanta, Ga.

THORDARSON clock, 120V-57-600 Ma, \$15, filament 21E20 5 volts 15 amp, \$4, National TMA 100, 6000 volt variac, \$4, Johnson 50C D11 dual, \$6, Eimac 4-250A tube with socket and fan, \$22, Eimac 304T1, \$6, W5DA, J. L. Young, Jr., 4425 Bordeaux, Dallas Texas.

SELL: NC-183 receiver, built in 100 Kc crystal calibrator, and matching 10 W. speaker, in excellent condition: \$189. F.O. Washington, D. C. W3PBO.

TIE-CLASPS: Your call letters handpainted in black on white, gold-edged, \$2.25. Ceramics by Gee, 270 Fairforest Road, Spartanburg, S. C.

SONAR CFC exciter/VFO. Best offer, K2AZL.

FEDERATION OF Long Island Radio Clubs Hamfest on Friday, October 15th at 8 P.M. at Lost Battalion Hall, Queens Boulevard, Elmhurst, L. I. Music, dancing, exhibits; Admission in advance \$2.00; at door, \$2.50. Make reservations with W2JZX, 18 Phillips Ave., East Rockaway, L. I., N. Y.

WANTED: Cash paid for BC-610 xmtrs and BC-221 frequency meters. In addition we buy technical manuals. Also TCS sets, R5A/ARN-7, ART-13, DV-17, others. Amber Company, 393 Greenwich St., New York 13, N. Y.

WANTED: Complete amateur station, 100 to 1000 watt; priced right. Preferably something on West Coast. Contact R. R. Cooper, 115 W. Ocean, Longbe, Calif.

FOR Sale: Collins aircraft transmitter, 813 modulated with pair of 811s. Complete with power supply, all cables and instruction book, \$115. Will trade for Eimac transmitter or receiver. W4VNN/9, Harold E. Roby, 614 Clence Dr., Belleville, Ill.

FOR Sale: 750 volt @ 75 amp and 300 volt at 1 amp, plus 6.3, 12.6, 25.2 volt filament power, and chassis power supply. Variac controlled, \$19.95; ARB receiver with 6.3 volt tubes and AC supply, \$24.50; BC-457 with 80 meter coils, \$6.95; BC-458 converted to 40 meters, \$7.95; BC-455, \$5.00. W8AL 50-watt exciter/transmitter with coils for one band, \$18.95; 70 watt PP 1625s in Class B modulator for crystal mike, \$9.75; Bendix TA-120 transmitter 100 watts, \$24.95; PE-101C converted dynamotor, \$3.75. Prices include tubes, postage collect. Above makes integrated station. Henry H. Harris, Jr., W4VPU, P. O. Box 1187, Charlottesville, Va.

WANTED: Navy TC5 transmitter and receiver with power supply and modulator in good condition. W7RWM, Merrill, Oregon.

SELL: 1 Kw phone and c.w. transmitter, bandwidth 10, 20, 40, 80, or network filter, Jennings 10-200 variable vacuum converter, Eimac 4-250A parallel, enclosed in copper, blower cooled, B&W low pass,

Class B 805 modulators, high level clipper and splash suppressor, restricted range speech amplifier, square meters, 32V3 and 75A3 plus 800 cy. filter and rtal calibrator, E-N and D104 microphone, Deluxe Vibroplex, 20 meter 3-1/2 inch. tuned beam gamma match, Radiart rotor W8RWZ, C. H. Buchanan, 1737 Fairway Dr., Springfield, Ohio.

MIC HIGAN HAMS! Amateur supplies, standard brands. Store hours 0800 to 1800 Monday through Saturday. Roy J. Purchase, W8RP, Purchase Radio Supply, 6053 Church St., Ann Arbor, Michigan. Tel. No. 8-8696, No. 8-8262.

SELL: Globe King 400B, 10, 20 and 160 M. coils, in excellent condx. Best cash offer. Floyd Miller, W0KHT, Manfred, N. Dakota.

WANTED: Mobile set, complete apparatus, sending and receiving. Rev. Michael Finnegan, St. Joseph Church, Chauvin, La.

FOR Sale: Viking I transmitter, complete with VFO and Harvey Wells TVS 50 transmitter, both like new. No reasonable offer refused. Prefer local sale. Robert L. Spitzer, Gregg Addition, Decatur, Ill.

ONE HRO 50T receiver, A, B, C, & D coils and matching speaker in excellent condition. F.O. Hamden, Conn. \$250. Raymond H. Zeek, 1633 Whitney Ave.

SALE: Viking II xmtr, VFO, low pass filter, Advance 7204 relay, 807 6146 tubes \$125. Now on 40 meter phone. Elbert N. Wood, W4OZY, Rte. 3, LaGrange, Ga.

RF Amplifier, pushpull 4-125A, MH40SL grid, plug in plate coils 80 thru 10, 10's included, completely de-TV'd with tubes R-46 and filament supply, \$100, BC-645 converted to 420, \$25, BC-455 converted double super 85Kc second IF and Motorola power supply, \$15. \$15 each, 807s, 50¢ each, HY69, \$1.00 each, 100T1 H, \$5.00, 807s, \$1.25, 225 00, W. J. Moulton, W9D5P, Rt. 5, Chippewa Falls, Wisconsin.

LETTINE Model 240 transmitter. Used exclusively on 10 meters. Complete with 10 meter coils and spare 807 \$58 plus shipping charges. Bob Tetrault, W1TPN, 28 Lucas Street, Portland, Maine.

HAVE QSTs 1945-48 complete. Also have RME-45 receiver. Best offer for both items. Bill Jaeger, 43 Southwick Dr., Bedford, Ohio.

COLLINS 32V-2, \$425, 32V-1, \$465, 75A-2, NC-88, \$79, 32V-3, \$645. Want: ARN-7, APR-4, ART-13, APN-9, BC-312, etc. Arrow Appliance, 38 Exchange, Lynn, Mass.

WANT: Collins 75A-2 or 75A-4. Cash for the best offer. State the serial number, condition and price prepaid. Leo Liebl, W9NVS, Medford, Wisconsin.

WANT: Universal Handi-Mike carbon microphone or cases only, Model 200, W1BB.

MOBILES! Reflectorized aluminum call signs. Regular 2" x 5", \$1.50, Jumbo size, 4" x 12", \$2.00. Overnight service. Whitley, W1JBC, 133 Airside Ave., Long Branch, N. J.

WANTED: HRO-60T. Will take crystal and extra coils if available. Broughton, 3116 S. 19th St., Portland, Oregon.

WANTED: S-76 receiver. Evert Williams, W4HPJ, Box 382, Blowing Rock, N. C.

WANTED: Good used 75A-2 or 75A-4. James H. Norton, W8SX, 4500 Penobscot Bldg., c/o Sta WWJ-TV Transmitter, Detroit 26, Mich.

SELL: cheap or trade QST, CQ, Radio News and Electronics back issues. Stamp for list. W9LFB, Madison, 2429 Smith, Ft. Wayne, Ind.

COMMERCIAL design applied to amateur equipment at amateur prices. What's your problem? Write to Arnold K. Beauchemin, ARCTB, Electronic Engineer, Member IRE, ARRL, 11-A Wayne Gardens, Collingswood, N. J.

VIKING II, VFO, low-pass filter, Matchbox, D-104 mike, all \$290 cash. Come and get it or will deliver 500 miles for gas. W4VJJ, Bourgeois, Box 305, Havelock, N. C.

TELEVISION closed-circuit camera employing 9 tubes and \$522.00 (scope), complete schematic and construction details for 55.00. Adaptable to home TV. Edward M. Noll, Box 94, Hathboro, Pa.

DON'T Fail! Check yourself with a time tested "Surecheck Test" Novice, \$1.00, General \$1.00. We pay postage. Amateur Radio Supply, 1013 Seventh Avenue, Worthington, Minn.

SELL or trade: Antennapacer, 81s, 829s, 872s, PE101. Want condenser checker, oscilloscope. W8SYA, Rosellini, 2619 So. Gaylord, Denver, Colo.

BC-440 for sale. This is a beautiful receiver, in beautiful condition, with AC power supply and speaker \$65.00. Allen Gordon, W3RC D, 4623 N. Broad St., Phila. 40, Penna.

ATTENTION VE Hams! For Sale: receivers: NC-125, like new, ARRD, in excellent condx; BC-112 converted Dynamotor 19 set and BC-458. Reasonable. John Somerville, VE3DJJ, Kearney, Ont., Canada.

HQ-129X recvr, in excellent condx and PP 75TL rig, 500 w. c.w. 350 phone in Par-Metal cabinet with Bud LF-401 TV filter, \$350.00. C. Reed, Jr., W8ZBK, Allen Junction, W. Va.

HQ-60 Perfect - A-F coils. Crystal Calibrator, Speaker, \$450.00. J. B. Murray, 1031 Maiden Choice, Baltimore 29, Maryland.

FOR Sale: Baker three-legged tower number 22TV, 25 foot ladder, complete instructions, shipment in Southern California preferred. \$25.00 F.O.B., Garden Grove, Calif. R. L. Fossett, 10931 Allen Drive.

HT-18 Hallcrafters VFO exciter bandswitching, 1 knob control; can drive an 813 or 4-125A on 80 thru 10, 60 watt 807W, power supply with meters in matching cabinet, bandswitching. Both units, \$90.00. W2HWH, 152 Garfield Place, Maplewood, N. J.

FOR Sale: Hallcrafters S-40B, perfect condition - bought new Christmas '53. Original carton, manual, \$85.00. R. Wood, 4605 Holmes, Kansas City, Mo.

FOR sale: SX71 and matching speaker. Good condition, need money for college. First check for \$150.00 takes both. R. B. Minch, 812 Hayden Ave., Akron, Ohio.

FOR Sale - Hallcrafters S38C Receiver, \$32.50, and 20 watt Novice transmitter, \$27.50. Both in excellent condition. John S. Kendrick, W6PMR, 5021 West 56 Street, Minneapolis, Minnesota.

NATIONAL 183 Receiver with speaker, good condition, \$175.00. Ethel Kleindorfer, Newton, Iowa, Route 3.

SELL or trade for used Television receiver unconverted SCR522. W7CBY, 1540 Third Street, Havre, Montana.

SALE: NC-88 Revr, new condition, \$97.50. Lyco 600 Transmitter, excellent, \$89. BC-457A with tubes, \$7.95. W6ODD, Box 776, Camarillo, Calif.

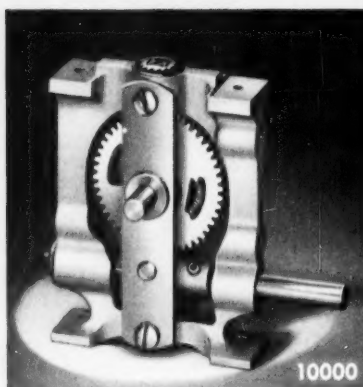
COLLINS 32V3 spare 4D32, brand new condition, \$575.00. W2AES, 218 Commonwealth Ave., Massapequa, Long Island, N. Y.



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# Application



## The No. 10000 WORM DRIVE UNIT

One of our original Designed For Application products, tried and proven over the years. Rugged cast aluminum frame may be panel or base mounted. Spring loaded nickel plated cut brass gears work with polished stainless steel worm to provide low back lash.  $\frac{1}{4}$ " diameter stainless steel drive and driven shafts. Available in two ratios, 16:1 and 48:1. Specify ratio in ordering.

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# USE RME

## FOR BETTER QSO'S

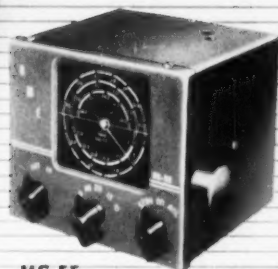
### Coming and Going!

#### MC-55 FIVE BAND MOBILE CONVERTER

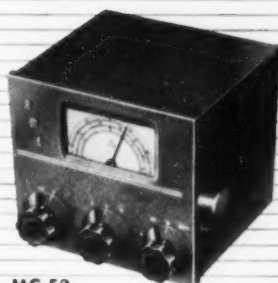
For 10, 15, 20, 40 and 80 meters. 1.25 micro-volt sensitivity on all bands. Edge-lighted dial. 25-to-1 worm gear tuning. ANL. Transmit-receive switch. Three gang tuning capacitor. Individual coils for each band. Aperiodic i.f. stage aids in providing high-gain characteristic. Input impedance 50-72 ohms. Output frequency 1550 kc. 150-180 v. at 18 ma. 6 or 12-volt operation. Tube lineup: 6BJ6 r.f. amp; 12AT7 osc-det; 6BJ6 i.f. amp; 6AL5 noise limiter. Dark gray. Size: 4 $\frac{1}{4}$ " high, 5 $\frac{3}{4}$ " wide, 5 $\frac{1}{4}$ " deep. Shpg. wt. 7 lbs. **Amateur Net. . . . . \$69.50**

#### MC-53 VHF THREE BAND MOBILE CONVERTER

Designed for 2, 6 and 10-11 meters. 1.25 micro-volt sensitivity on all bands. 25-to-1 worm gear tuning. Individual coils for each band and each circuit. Three gang tuning. Aperiodic i.f. stage aids in providing high gain characteristic. Separate input connectors for each band. Send-receive switch. ANL. VR provides excellent stability. 6-volt operation. 150-180 v. at 25 ma. Output frequency 1550 kc. 6AK5 r.f. amplifier; 12AT7 osc-det; 6BJ6 i.f.; 6AL5 limiter and OB2 voltage regulator. Gray enamel. Size: 5 $\frac{3}{4}$ " wide, 4 $\frac{1}{8}$ " high, 5 $\frac{1}{4}$ " deep. Shpg. wt. 7 lbs. **Amateur Net. . . . . \$66.60**



MC-55



MC-53



DB-23



RME-100

#### DB-23 PRESELECTOR

Substantially improves the performance of any receiver. Three 6J6 twin triodes as neutralized push-pull stages in combination of selective and wide band r.f. amplifiers. Minimum gain of 20 db all ham bands from 3.5 to 30 mc with substantial image rejection. Signal-to-noise improvement can be as much as 7.5 db over the receiver itself. Permits optimum use of mechanical, crystal or audio filters. Input circuits match standard type antenna. Set band and adjust peaking control. With power supply. Blue-gray. Size: 5" high, 7 $\frac{1}{2}$ " wide, 6" deep. Shpg. wt. 8 lbs. **Amateur Net \$49.50**

#### RME 100 SPEECH CLIPPER

Peak limiting pre-amplifier provides higher articulation and intelligibility to combat QRN and QRN. Ideal for use with Johnson Viking, Collins 32V and all ham-built equipment. Clipping level adjustable from 3-20db. Pi low-pass filter provides high suppression of generated harmonics above 3000 cps, concentrating voice power to most effective band of frequencies. Response 200-3000 cps. If set to provide 100% modulation, louder speech will not over-modulate. Front panel input for Hi-Z microphone accommodates PTT circuit. Tube lineup: 6SC7, 6H6 and 6X5GT rectifier. With power supply in blue-gray steel cabinet. Size: 5" high, 7 $\frac{1}{2}$ " wide, 6" deep. Shpg. wt. 9 lbs. **Amateur Net \$39.50**

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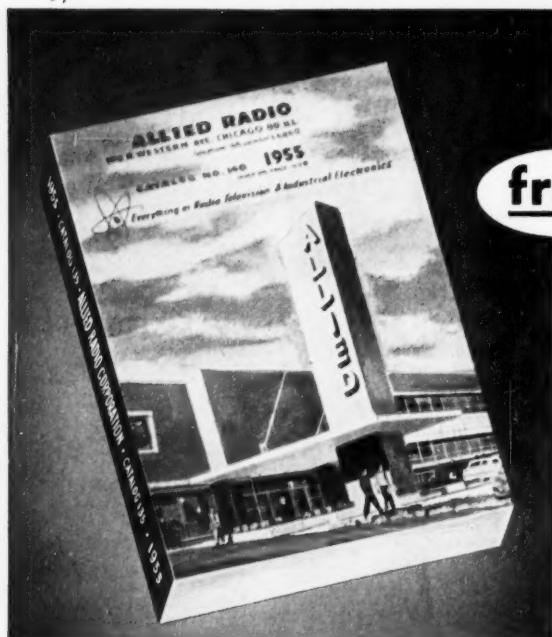
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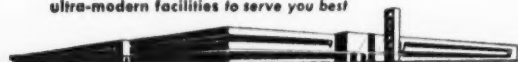
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## SINGLE SIDE BAND SELECTOR

USUALLY this page is devoted to descriptions of successful amateur activities or equipment, except for a few journeys down Hi-Fi lanes as of late. This month, as a new twist, we will describe what might be termed an "unsuccessful activity" . . . at least from the amateur standpoint. We're sure it will be of interest to experimenters and present it to indicate the extent to which

we at Natco go in investigating the performance possibilities of each piece of equipment that we manufacture.

For some time it has been apparent to us that only *one sideband of a double sideband AM phone signal* need be received for detection of intelligence. In theory, the addition of a single sideband detector, capable of sideband selection, should improve any communication receiver. Such a device was constructed by the writer in 1949, and although Lab test indicated proper operation, it was disappointing in the amateur bands. Earlier this year the Company became interested in a statistical evaluation of this system.

Two identical HRO-60 receivers were set up at the writer's QTH and connected through suitable isolation resistors to the same antenna. The first HRO-60 was a standard model, the second was followed with a military SSB converter of proven design. A binaural tape recorder was set up to record the two audio outputs. The crystal filter in the first HRO served as the QRM evaporator, while the selectable sideband and exalted carrier feature of the second setup was used for the same purpose. During a three day period (this is work?) stations were worked in the 75 and 20 meter bands and a total of 8500 feet of binaural tape was recorded.

To evaluate the tapes, two experienced operators using earphones and micro-switches connected to electric clocks counted "minutes of readability" by pressing their switches whenever readability was possible. A third clock was connected to measure the time that readability was simultaneously possible in both channels. A third operator with another switch and clock edited the tapes for maximum possible copy time by holding the switch down only after a contact had been established and readability should have been possible in the absence of QRM or fading. The results were:

Edited possible copy time . . . . .	153 minutes	HRO-60 plus SSB converter . . . . .	57 minutes
HRO-60 alone . . . . .	91 minutes	Both channels good . . . . .	51 minutes

This provided the following information:

1. Our average QSO was about 68% readable. (Stations worked included: W6, G, F, DL, ZS, GW, VQ4, etc.)
2. The single sideband converter provided 6 minutes of readability when copy was impossible with the crystal filter.
3. The HRO-60 alone provided 40 minutes of readability when copy was impossible with the SSB converter.
4. Without a crystal filter less than 38% readability would have resulted.

This provided for us a comparison of reception with a crystal filter and an SSB converter. Since the same crystal filter is used in both the HRO-60 and the NC-183D, the same protection against interference is available in both receivers. This should not be taken as a comparison of Single Sideband as a system since this is another question.

We would appreciate comments relative to the choice of information chosen for this page, so that we may better serve you.

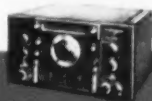
73, Ed HARRINGTON, W1JEL

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Type No.	DC Plate Input (Watts)	DC Plate Volts	Plate Dissip. (Watts)	Max. Freq. * (Mc.)
RCA 810	750	2500	175	30
RCA 811-A	260	1500	65	30
RCA 812-A	260	1500	65	30
RCA 833-A	1000	3300	350	30
RCA 8000	750	2500	175	30
RCA 8005	300	1500	85	60

\*For Max. Plate Input and Voltage

For Class B Modulator Service (2 tubes)		Typical Operation Values	
Type No.	DC Plate Volts	Max. Sig. DC Plate Cur. (Max)	Max. Sig. Power Out. (Watts)
RCA 805	1250	400	300
RCA 810	2250	450	725
RCA 811-A	1750	350	0
RCA 812-A	1500	310	-48
RCA 8000	2250	450	-130
RCA 8005	1500	330	-67.5

RCA Power Triodes—as well as ALL types of RCA tubes—are readily available through your neighborhood RCA Tube Distributor. For technical data, write RCA, Commercial Engineering, Section G15M, Harrison, New Jersey.



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